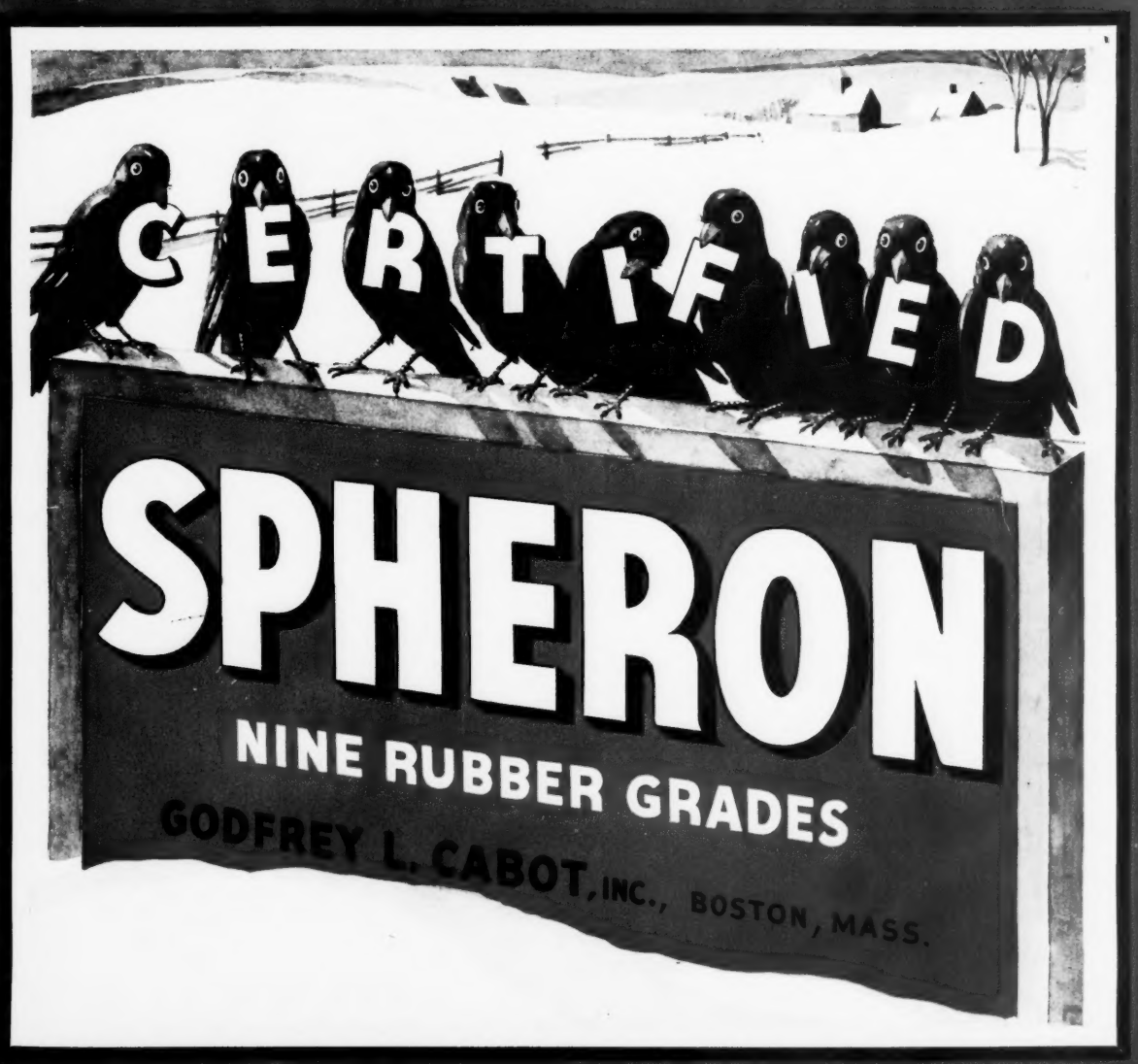
INDIA RUBBER WORLD

MARCH 1. 1942



A BILL BROTHERS PUBLICATION

Newsletter No. 3 *PUBLISHED BY RUBBER CHEMICALS DIVISION OF* DU PONT *MARCH 1942*

Improved Reclaimed Rubber Compounds Possible by use of Accelerator 808 or Thionex

TRUE CONSERVATION in the Rubber Industry means more than the mere substitution of reclaimed for crude rubber in existing compounds. While more reclaimed and less crude rubber must now be used, it is vitally necessary to compound and vulcanize the mixture in such a way that the finished product will have the longest possible service life.

The quality of products containing substantial amounts of reclaimed rubber depends on the quality of the reclaim and to a large extent upon the vulcanization accelerators used. From the standpoint of background information, economy and probable availability, the two best accelerators for compounds containing large proportions of reclaimed rubber are Accelerator 808 and Thionex.

ACCELERATOR 808 is the familiar aldehyde-amine type accelerator identified chemically as a condensation product of butyraldehyde and aniline. It has long been recognized as an outstanding accelerator for stocks containing reclaimed rubber.

When vulcanized with Accelerator 808, stocks containing reclaimed rubber have a very rubbery, snappy feel and age exceptionally well. As clay inhibits vulcanization of 808 accelerated stocks, Thionex is recommended as the accelerator in compounds containing high loadings of clay.

BASE TEST COMP.	1	2
Smoked Sheets	45.	45.
Whole Tire Reclaim	100.	100.
Zinc Oxide	5.	5.
York Whiting	58.	–
Crown Clay	–	56.
Stearic Acid	2.	2.
NEOZONE A	1.	1.
Acceleration	as shown	as shown
Sulfur	3.3	3.3

THIONEX, a well-known thiuram type accelerator identified chemically as tetramethyl-thiuram-monosulfide, has been widely used for years in the production of quality rubber goods. At the present low price, Thionex is very economical to use and is the best all-round accelerator for stocks containing a large proportion of reclaimed rubber. To improve processing safety, litharge should generally be used with Thionex. When used in approximately the same amount, litharge moderately retards the cure of Thionex accelerated stocks at low temperatures but has no effect at curing temperatures of 258°F. and above.

TEST DATA: The accompanying data illustrate the value of Accelerator 808 and Thionex in stocks containing reclaimed rubber. The base recipes for the compounds tested are shown at the left below.

CONSERVATION OF NEOPRENE Cements made from Neoprene Types GN or CG have excellent storage stability when compounded with normal amounts of magnesia and zinc oxide. However, some cements specially compounded or accelerated to cure at room temperature are quite unstable. If a neoprene cement becomes stringy and livery, or even fully gelled, it may be peptized to a usable viscosity by the addition of Accelerator 552, small quantities of which may be added to the cement in the form of a 20% solution in benzol. For partially gelled cements 0.25% to 1.0% of Accelerator 552 on the neoprene content of the cement is generally sufficient. For completely gelled cements, 1.0% to 5.0% Accelerator 552 on the neoprene is required.

Conservation of neoprene through recovery of stringy or gelled cements by these methods is discussed in detail in a recent report entitled "Peptization of Partially and Completely Gelled Neoprene Cements."

PHYSICAL TEST DATA

PRESS CURE 15 MIN. AT 287°F.

Acceleration	Amount	Accelerator Cost	Base Comp.	Stress at 400% El.	Tens. Str. p.s.i.	El. at Break %	Hardness Shore	Oxygen Bomb* Aged 5 days % Tens. Str. Retained	Oven Aging** 10 days % Tens. Str. Retained
Accelerator 808	0.5	$ .31	1	700	1500	600	45	67	95
Accelerator 808***	0.5	$ .31	2	–	–	–	–	–	–
Thionex	0.18	$ .28	1	750	1500	570	47	53	90
Litharge	0.18								
Thionex	0.18	$ .28	2	1225	1925	515	50	59	88
Litharge	0.18								

* *Exposed to oxygen at 300 p.s.i. and 70°C.*
** *Geer Oven. Exposed to circulating air at 70°C.*
*** *No cure due to retardation of clay.*

Through the Mill

NEOPRENE TYPE ILS *is an improved form of Neoprene Type I. As indicated by the initials "ILS," the new material has even Lower Swell in oils and solvents than Neoprene Type I. Neoprene Type ILS may be directly substituted in present Type I compounds without any other change in the formula. In comparison with Type I, Neoprene Type ILS vulcanizates swell less and retain a greater percentage of original tensile strength after immersion in solvents. They have higher tensile strengths and elongations at break, better resistance to heat and oxidation; equal water resistance, resilience, compression set, and tear strength. Neoprene Type ILS will be supplied in the future on all orders calling for Type I.*

BRRR! *A double texture fabric combined and coated both sides with a high grade neoprene compound cracked on creasing at −90°F. It did not crack at −80°F.*

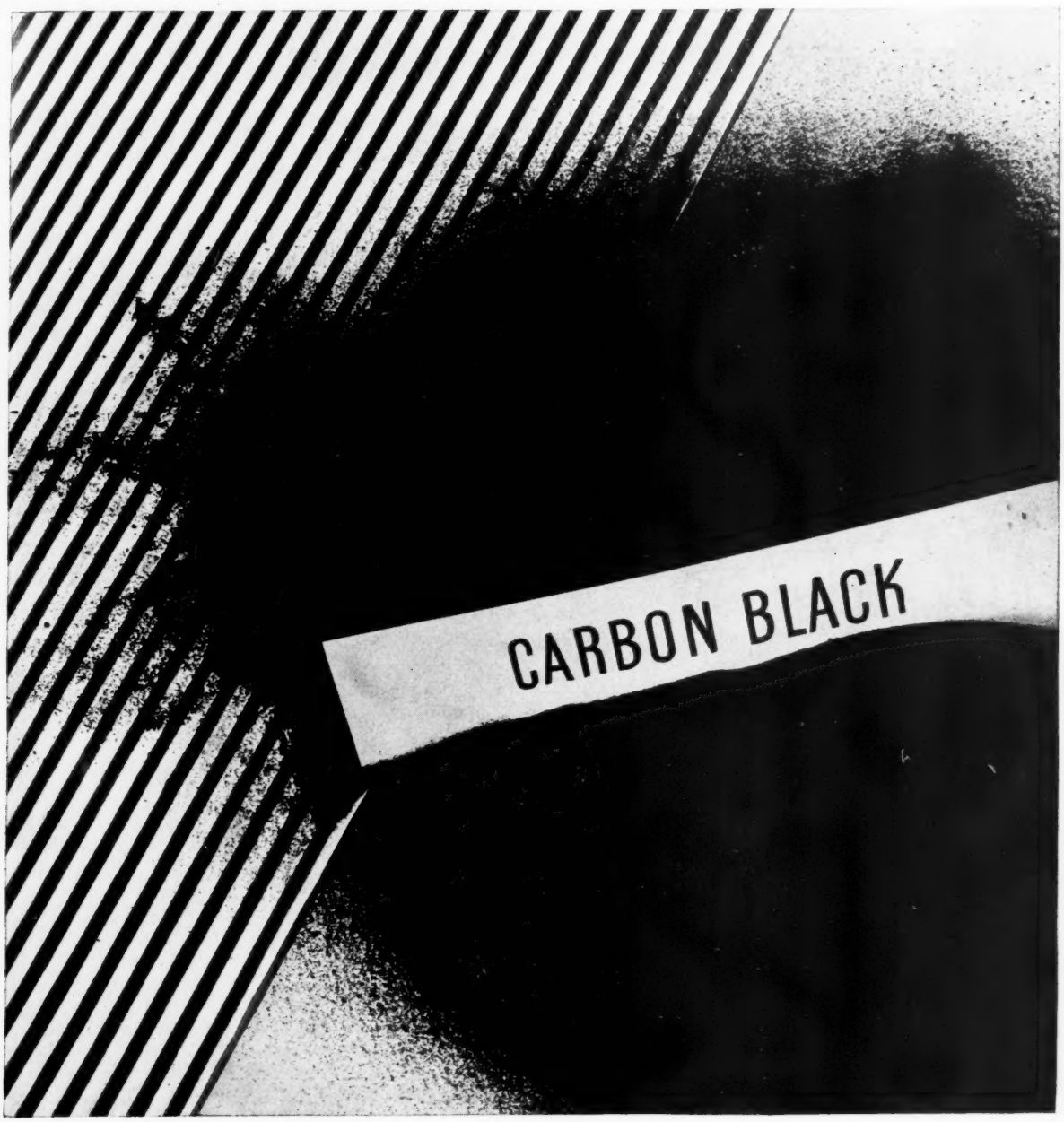
THE FOLLOWING *recently published informal reports are available on request. Just drop us a line on your company letterhead stating which ones you wish:*

1. *Freeze Resisting Rubber Compounds.*
2. *The Effect of Reclaim, Tread Buffings, Mineral Rubber and Pine Tar on the Rate of Wear of Tread Stocks Used for Recapping Tires.*
3. *Abrasion Resistance of Neoprene Jacket Stocks.*
4. *Solvents for Neoprene Cements.*

RUBBER CHEMICALS DIVISION

Wilmington DU PONT *Delaware*

INDIA RUBBER WORLD, March 1, 1942, Vol. 105, No. 6. Published monthly by BILL BROTHERS PUBLISHING CORP., 420 Lexington Avenue, New York, N. Y., U. S. A. Entered as second class matter October 5, 1889, at the Post Office at New York, N. Y., under the act of March 3, 1879. Subscription, $3.00 a year domestic; Mexico, $3.50; all others, $4.00; single copies, 35 cents.



...MORE IMPORTANT THAN EVER

Never have the qualities imparted by carbon black been so important in rubber as now — toughness, strength, durability, abrasion resistance. Witco Blacks, because of their excellent dispersing properties, obtained by extremely exacting methods of control, are noted for their efficiency in imparting these qualities. There is a Witco Carbon Black for every compounding purpose. Give your products the benefit of their controlled quality and uniformity. Witco's staff will gladly assist you in using them to obtain the best results in your formulations. Mail the coupon for samples TODAY.

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New York, 295 Madison Ave. • Boston, 141 Milk St. • Chicago, Tribune Tower
Cleveland, 616 St. Clair Ave., N. E. • Witco Affiliates: Witco Oil & Gas Company
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WISHNICK-TUMPEER, INC.
295 Madison Avenue, New York, N. Y.

GENTLEMEN: Please send me samples of Witco Carbon Blacks for rubber formulation.

Name_____
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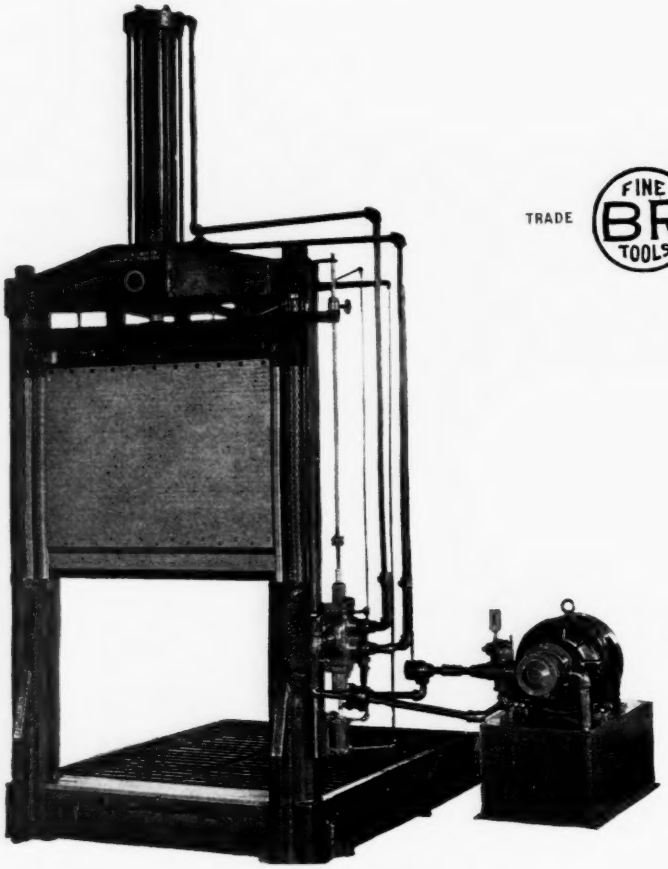
MORE EFFICIENT CUTTING OF CRITICAL MATERIALS FOR PROCESSING PURPOSES



TRADE FINE BR TOOLS MARK

This big, husky BLACK ROCK guillotine type cutting machine will efficiently slice bales of FRICTION SCRAP STOCK, CRUDE RUBBER, RECLAIM, PAPER, NITROCELLULOSE PRODUCTS, WAX and other similar materials in preparation for further processing.

The machine is a self-contained hydraulically operated unit. One or more pieces of stock having a total area of 44″ wide and 35″ high can be inserted under the knife.

BLACK ROCK MANUFACTURING COMPANY

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Pacific Coast Representatives:
Lombard Smith Co.
2032 Santa Fe Ave.,
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TONOX

A Big Help in Conserving Rubber

In the present emergency it is more important than ever to get the maximum quality in your products from the materials available.

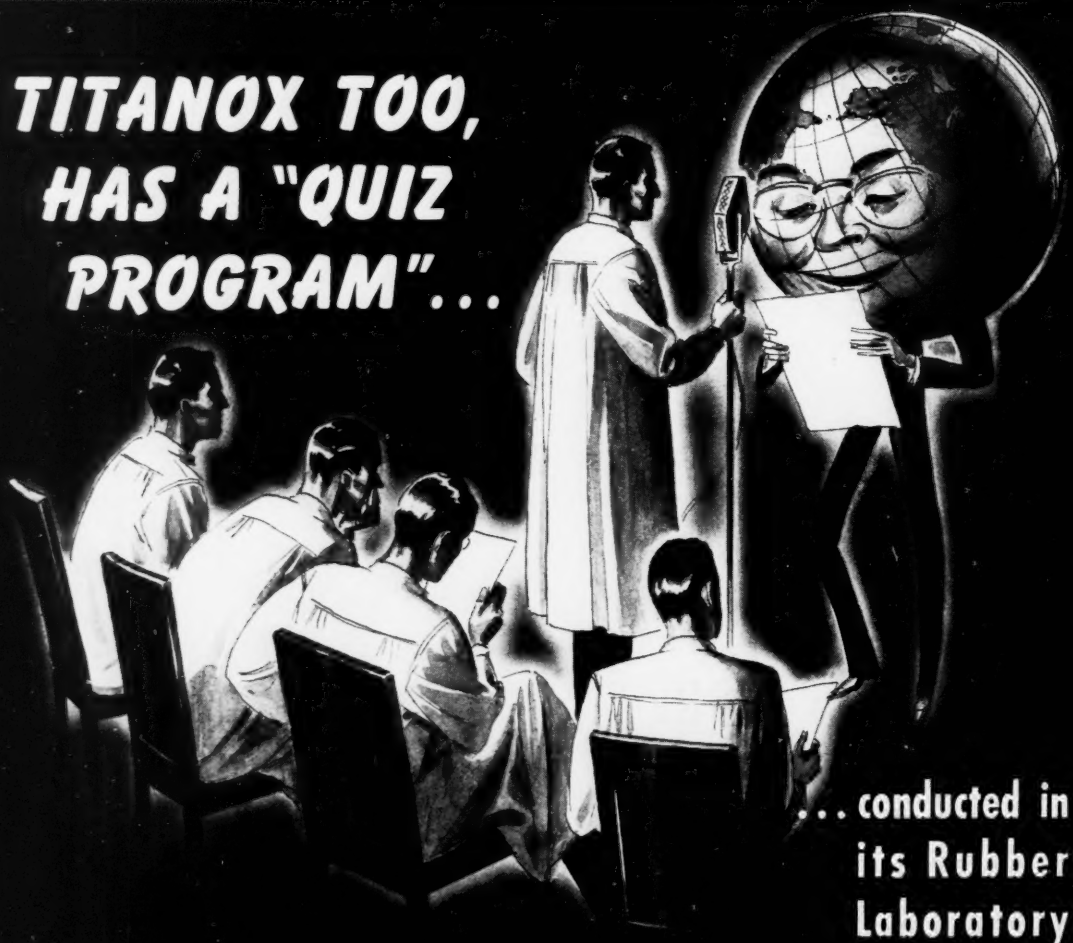
Tonox is an effective chemical for improving the quality of many rubber products.

Here are some results now being obtained by using Tonox:

- In Tire Treads: Better abrasion resistance, less cracking, lower heat build-up.
- In Tire Carcasses with high reclaim: Better flexing, better properties when hot, better aging.
- In Wire Insulation: Better processing, stiffening uncured stocks to prevent flattening.
- In Footwear: Inhibits frosting and cracking.

Naugatuck Chemical
DIVISION OF UNITED STATES RUBBER COMPANY
ROCKEFELLER CENTER NEW YORK, N. Y.

TITANOX TOO, HAS A "QUIZ PROGRAM"...



...conducted in its Rubber Laboratory

CONFRONTED by the shortage of crude rubber, the more extensive use of reclaimed rubber, the search for substitutes for materials no longer procurable, and new conditions created by government specifications for new products, the lot of the manufacturer of white and light-colored rubber products certainly is not a happy one. The white rubber world wants answers to the resulting questions which arise.

It is with pleasure that the makers of TITANOX pigments offer in this emergency the assistance of their rubber laboratory staff and equipment in helping to solve technical problems involving the use of these pigments.

Through knowledge of titanium pigments and their use in rubber compounding, our technical staff has been able to smooth the road for many of our customers. We will gladly help *you* to get the full benefit from your TITANOX pigments.

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT
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TITANOX
TRADE MARK

TITANOX
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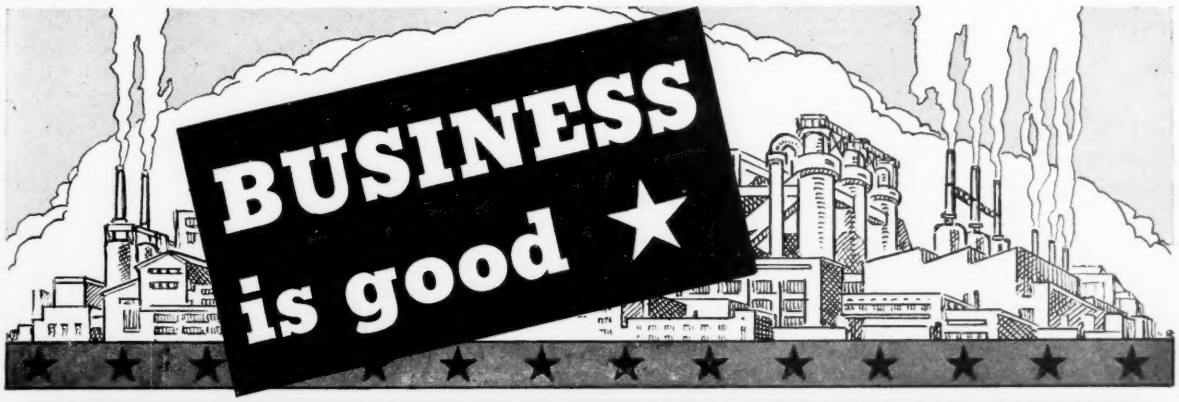

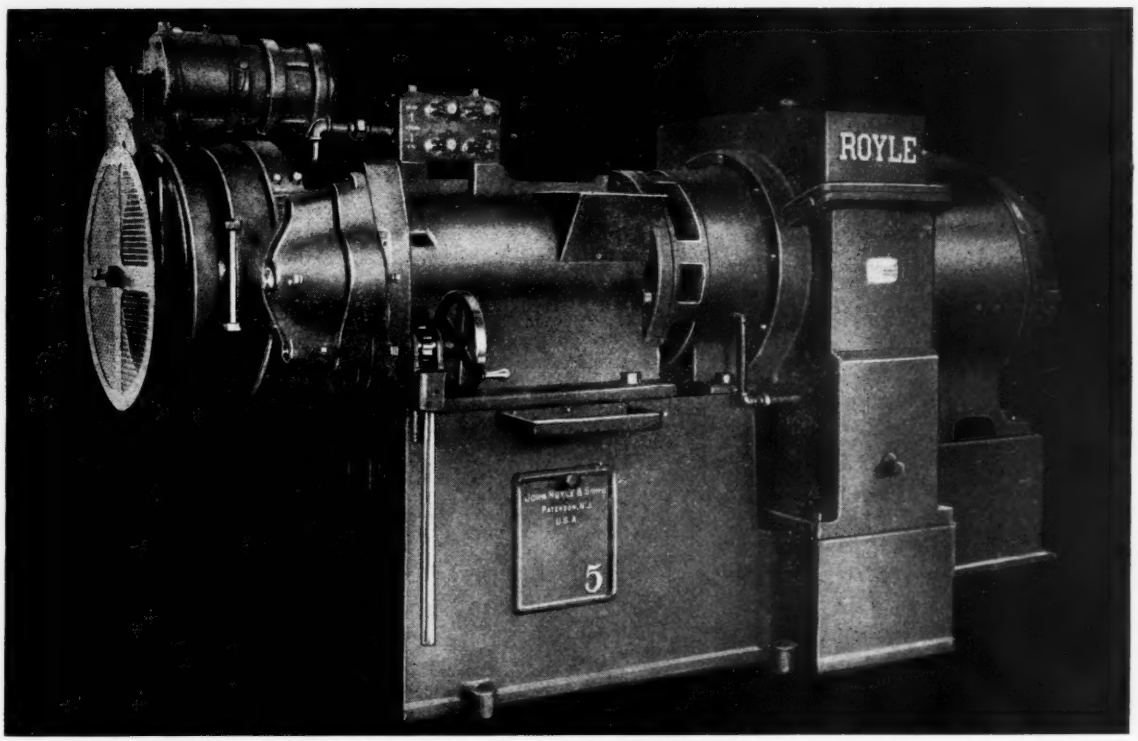

A PRODUCING STRAINER! THE ROYLE 8½" WITH MANUALLY-OPERATED BREECH LOCK HEAD

In factories throughout the country, chimneys belch black smoke and giant machines roar as raw materials are converted into goods that make America strong.

★ **BUSINESS IS GOOD** because industry is bustling to produce the goods and machines required to build guns, planes and ships, vital to national defense.

John Royle & Sons is typical of America today as she strains to meet the quickening demand. Our business is good because of the increasing demand for the kind of quality and service we give. To the limit of our facilities, top service is always at your call.

John Royle & Sons *Since 1855*

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ROYLE'S 62 ND. YEAR OF EXTRUDING MACHINE MANUFACTURE

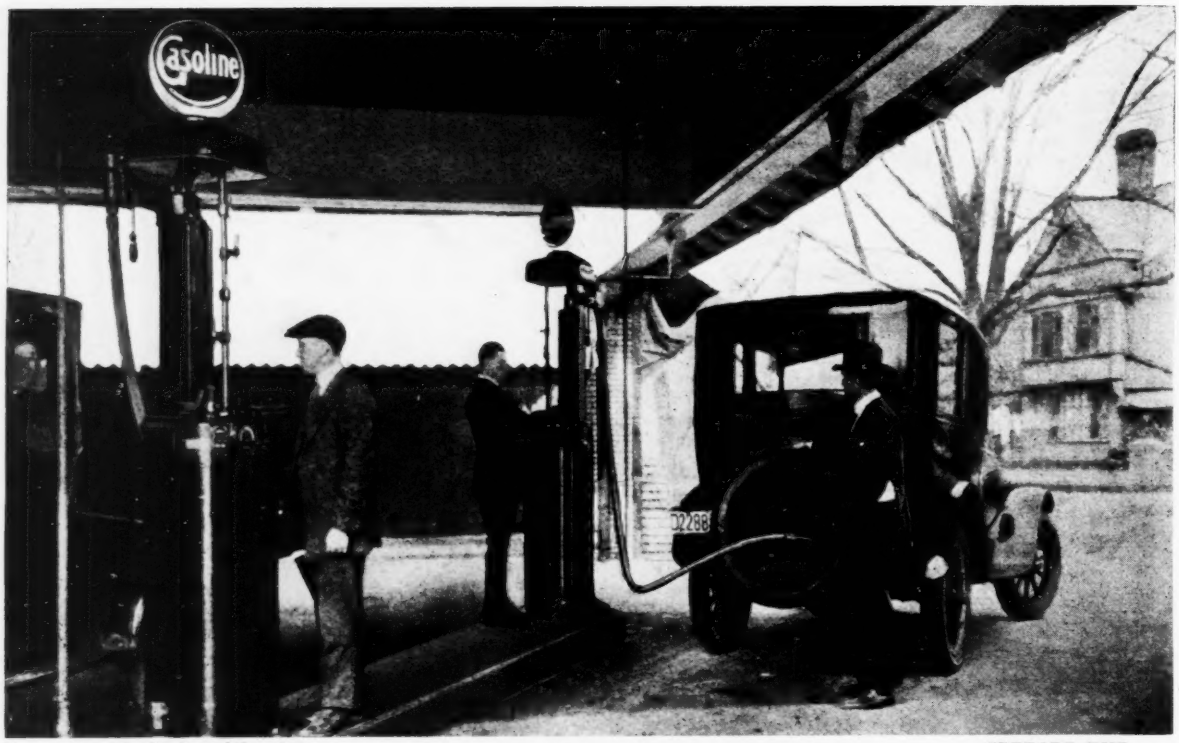

Photo courtesy, Gasoline Pump Mfgrs. Assn.

"BEFORE THE DAYS OF GASTEX"

GASTEX and PELLETEX PROLONG LIFE of Many Types of Hose—

In recent years the service life of many types of hose has been greatly lengthened by the development of special hose materials for specific purposes. Synthetic rubber compounds have been found superior for hose conveying gasoline and solvents.

GASTEX and PELLETEX, the special process blacks, have contributed greatly to the excellency of these compounds, both rubber and synthetic. In promoting resistance to aging, to fatigue with resultant cracking, and to abrasion, GASTEX and PELLETEX, used in tube, friction and cover stocks, have made an important contribution to industrial progress.

Technical information on the behavior of Gastex stocks in all types of hose will be sent when requested on firm's letterhead.

GENERAL ATLAS CARBON DIVISION

OF GENERAL PROPERTIES COMPANY, INC.

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PELLETEX TRADE MARK

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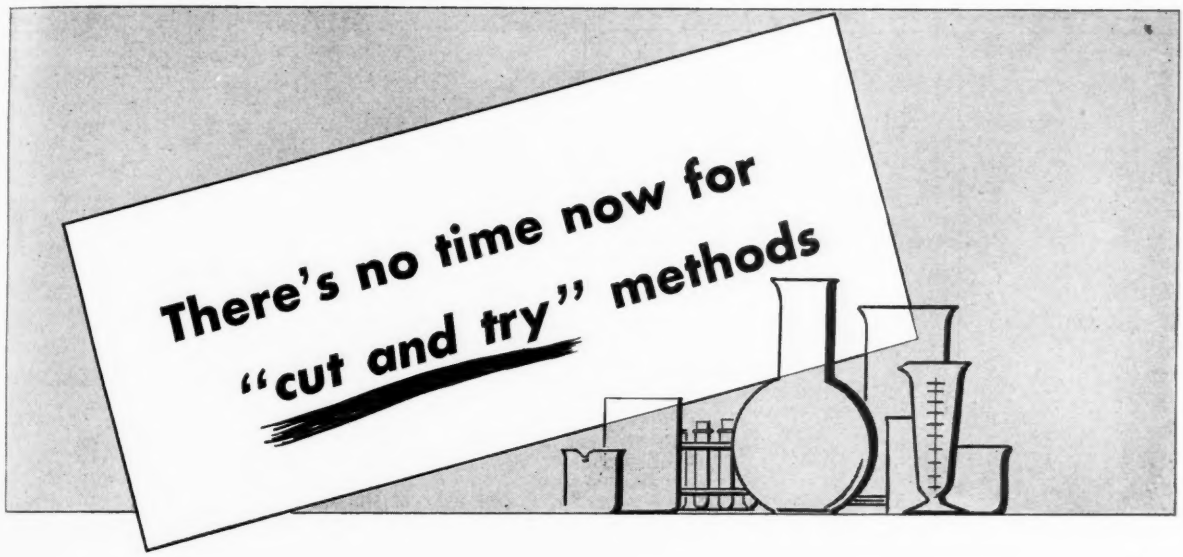

WAR PRODUCTION OF SYNTHETIC RUBBER *DEMANDS*

PRECISION

-in processes
-in materials

You can depend *absolutely* on the uniform quality of all PICCO Chemicals, including the following, specially prepared for the rubber industry.

Di POLYMER OIL for plasticizing synthetic rubber of the co-polymer butadiene types.

TYPE C RECLAIMING OIL for reclaiming synthetic rubbers.

PICCOUMARON XX SERIES RESINS (para-coumarone-indene) for extending and compounding natural and synthetic rubber.

PICCOUMARON RESINS for hardening, leatherizing or softening mechanical rubber goods.

PICCO RECLAIMING OILS (D-4, E-5, C-10) for reclaiming rubber by autoclave or pan methods.

PICCOLYTE RESINS—similar chemical analysis (carbon-hydrogen ratio) to rubber; for extending, tackifying and cementing.

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INDUSTRIAL CHEMICAL CORPORATION
CLAIRTON, PENNA.

Representatives in Principal Cities

Makers of: Coumarone Resins • Coal Tar Naphthas • Rubber Plasticizers • Reclaiming Oils

for **INSULATED WIRE**

Tensile strength
Resistance to aging
Dielectric strength

Write Our Technical Service Dept. for Details.

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Muscles for Rubber

RUBBER is a fighting word in this World War . . . a fighting product made harder, and tougher, and longer-lasting by *reinforcement with carbon black.*

Tanks, trucks, aeroplanes, artillery and naval units, in scores of different ways, depend upon rubber reinforced with carbon black for much of their fighting efficiency, maneuverability and stamina.

Carbon black literally puts "muscles" in this combat rubber. It strengthens it, toughens it and lengthens its life.

It makes our Army, Navy and air equipment fight better and last longer.

The production of carbon black for use on the factory front and on the battle front is a responsibility of the United Carbon Company. That this vital product shall be the finest that this company's resources and man-power can produce, is our Victory Pledge.

UNITED CARBON COMPANY, INC.
Charleston, West Virginia

DIXIEDENSED AND KOSMOBILE STAND FOR THE HIGHEST DEVELOPMENT IN BLACKS FOR RUBBER COMPOUNDING.

KOSMOS-DIXIE 20, A NEW UNTREATED DUSTLESS SEMI-REINFORCING CARBON BLACK.

ZINC IN WAR

5 CERAMICS

"AN ARMY MARCHES ON ITS STOMACH"

U. S. ARMY SIGNAL CORPS PHOTO

The United States armed forces are not only well fed, but a high degree of cleanliness is maintained in the preparation and serving of the food. White is the symbol of purity, and zinc pigments not only make *paint* whiter and more durable, they also serve in this capacity in *tiling*, *porcelain enamelware* and *dishes* in Army and Navy kitchens and mess halls.

Zinc oxide is used as a flux in ceramics to provide whiteness and gloss and to resist the shock of sudden temperature changes. Its presence prevents crazing of pottery and chipping of porcelain enamel. In ceramic manufacturing, zinc oxide provides such indispensable formulation features as fusibility, non-volatilization and wide temperature range.

When one considers the number of American soldiers, sailors and marines to be fed "three squares a day" — plus the fact that imports of European ceramic products have been cut off almost completely — the demands for zinc oxide by our ceramic industry can be appreciated.

This is just another one of the normal uses for zinc which has become greatly expanded by war needs — one more reason why civilian users may not be able to obtain all of the zinc they would like to use.

DIE CASTING

METAL SPRAYING

GALVANIZING

PHARMACEUTICALS

NICKEL SILVER

1 HULL PLATES

2 RUBBER

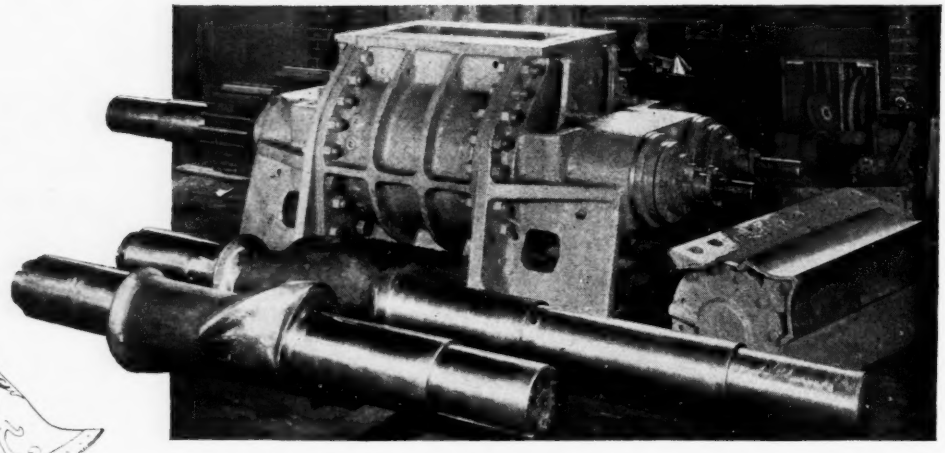
3 PAINT

4 BRASS

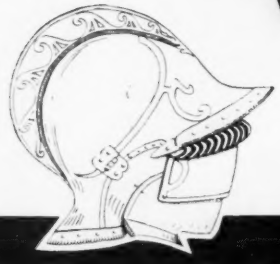
THE NEW JERSEY ZINC COMPANY

MANUFACTURERS OF THE FAMOUS HORSE HEAD ZINC PRODUCTS

New Jersey zinc



This photograph shows a completely rebuilt No. 9 Banbury and a set of No. 11 hard-surfaced rotors ready to leave our plant . . . All work completed in record time to meet emergency requirement.



ARMOR for Banburys in the Battle of Production . .

★

If you have spare or worn Banbury parts write us at once . . . We will pay cash for them . . . Remember, too, you will be serving a patriotic cause by helping maintain some other Banbury on the production line.

★

Rebuilding, hard-surfacing and repairing Banburys has been our specialty for years . . . Today our service is *maintaining* as well as reinstating the efficiency of Banburys on the production line . . . Our process for hard-surfacing rotors and mixing chambers provides a new "armor" that resists longer the wear and tear of capacity output through continuous operation . . . Now, more than ever before, your Banburys need a new lease on life . . . We can help you keep them rolling with *dependable* long-time service. Call us for a check-up on your Banburys before a breakdown makes production delay costly . . . We are working 24 hours a day to give quickest possible service. Write, wire or phone us now.

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914 Miami Street *Akron, Ohio* *Phone JE 7970*

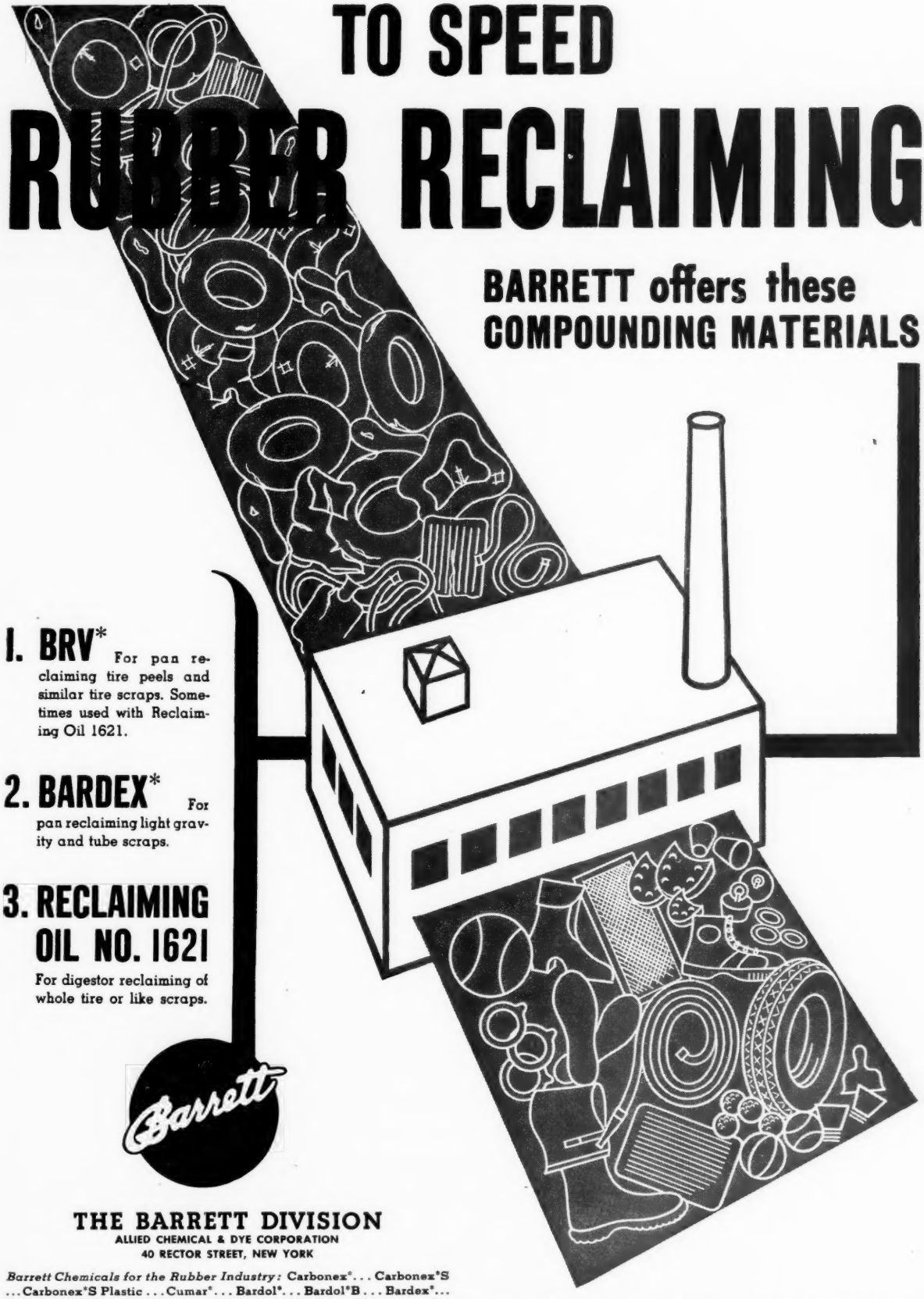
INTERSTATE WELDING SERVICE

Main Plant **AKRON, OHIO**

EXCLUSIVE SPECIALISTS IN BANBURY MIXER REBUILDING

TO SPEED RUBBER RECLAIMING

BARRETT offers these COMPOUNDING MATERIALS



1. BRV* For pan reclaiming tire peels and similar tire scraps. Sometimes used with Reclaiming Oil 1621.

2. BARDEX* For pan reclaiming light gravity and tube scraps.

3. RECLAIMING OIL NO. 1621 For digestor reclaiming of whole tire or like scraps.

Barrett

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK

Barrett Chemicals for the Rubber Industry: Carbonex*... Carbonex*S ...Carbonex*S Plastic ...Cumar*... Bardol*... Bardol*B ... Bardex*... B.R.H.* No. 2 ... B.R.T.* No. 7 ... B.R.V.*... S.R.O.*... Reclaiming Oil No. 1621...B.R.C.* No. 19E...Dispersing Oil No. 10...Resin C* Pitch

*Trademark Reg. U. S. Pat. Off.

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16,000 REPRINTS

OF ARTICLES IN

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WERE ORDERED AND
PAID FOR BY READERS
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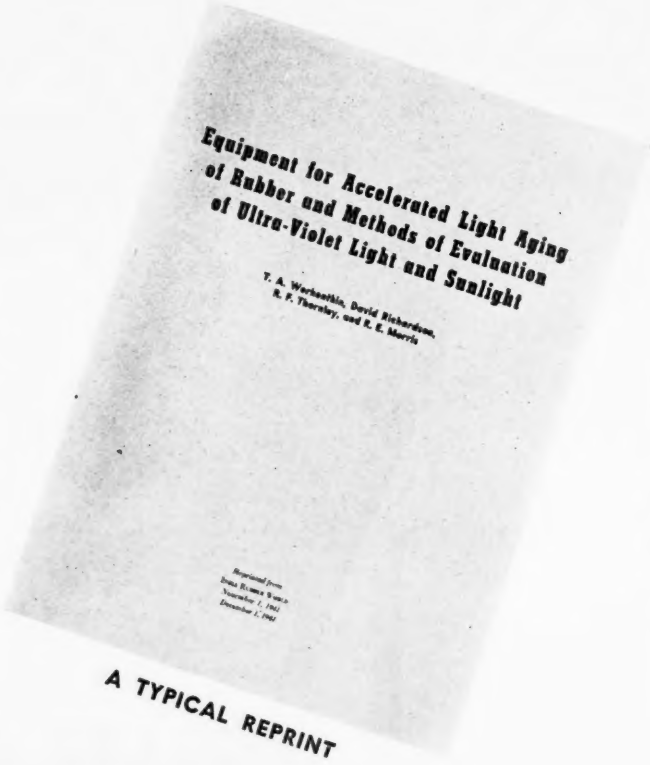

Equipment for Accelerated Light Aging of Rubber and Methods of Evaluation of Ultra-Violet Light and Sunlight
T. A. Werkenthin, David Richardson, R. P. Thornley, and R. E. Morris

A TYPICAL REPRINT

THE REASON

Articles appearing in INDIA RUBBER WORLD are recognized by the members of the rubber industry throughout the world as authoritative—written by men who know. The publication is the only one in its field edited by graduate engineers with long practical experience in rubber manufacturing. Its editorial prestige has been maintained through 53 years of service to this one industry.

READER INTEREST BRINGS ADVERTISING RESULTS

That is why INDIA RUBBER WORLD carries *more* display advertising than any other publication in the field.

Remember — Rubber is on the defense priority list.

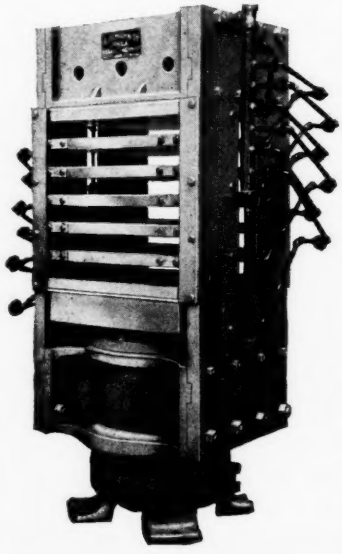
WRITE FOR MARKET AND CIRCULATION DATA AND RATES

INDIA RUBBER WORLD

420 LEXINGTON AVE. ESTABLISHED 1889 NEW YORK

R. D. WOOD PRESSES

are designed and built for high production, easy operation, low maintenance and long life. The line of standard Wood hydraulic presses includes units of practically every type and size, and special presses will be built to meet unusual requirements. Wood engineers will be pleased to consult with you on your press problems.

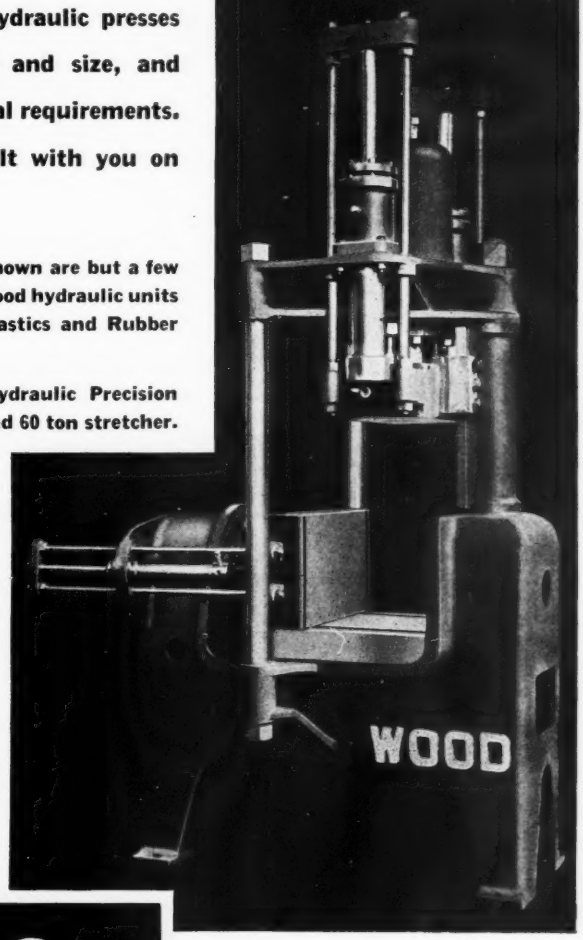


The three presses here shown are but a few of the many standard Wood hydraulic units that are used in the Plastics and Rubber Industries.

Above is a 3180 ton Hydraulic Precision Belt Press with clamp and 60 ton stretcher. Steam plates 66″ x 30′-0″ have polished working surfaces.

At the right is a 63 ton Angle Molding Press having an 8″ diameter x 16″ stroke vertical ram and an 8″ diameter x 10″ stroke horizontal ram.

At the left is a 314 ton steam Platen Press with a 20″ ram and 18″ stroke. The six platens are each 30″ x 30″ x 2″.



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R.D.Wood Co.

PHILADELPHIA, PA.

...HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE

SHAW

BALE CUTTERS

MECHANICAL BALE CUTTING MACHINE

For the larger plants
maximum output
40 bales per hour

HYDRAULIC BALE CUTTING PRESS

For the smaller plants
Maximum production
10 bales per hour

FRANCIS SHAW & CO. LTD.
MANCHESTER.11. ENGLAND

LIMITED QUANTITIES AVAILABLE!

Shamva

TRADE MARK REG. U.S. PAT. OFF.

WHITE HEAVY CALCINED MAGNESIA

Manganese Free

Where whiteness is a factor . . . where exacting specifications of purity and uniformity must be complied with, Shamva, as an accelerator helps maintain close control necessary for producing high quality in either synthetic or natural rubber.

Shamva is "built up" from a *natural* base of selected, manganese free, quality ores. This gives added assurance that results in the finished product will be as anticipated.

In one grade only. Limited quantities available for immediate shipment. Write for complete information on this product today.

GOLWYNNE
CHEMICALS CORPORATION
420 LEXINGTON AVENUE • NEW YORK, N. Y.

WORDS are worthless unless punctuated with *action!* Right now, more than at any other time in the history of this country, America must have action *from every man on every job.*

Our job is to provide the kind of Skellysolve you need and to *get it to you* when you need it.

We can and will do both . . . *any* quantity within reason—*anywhere.* Write, phone, or wire and you'll get action.

SKELLYSOLVE
in the
RUBBER INDUSTRY

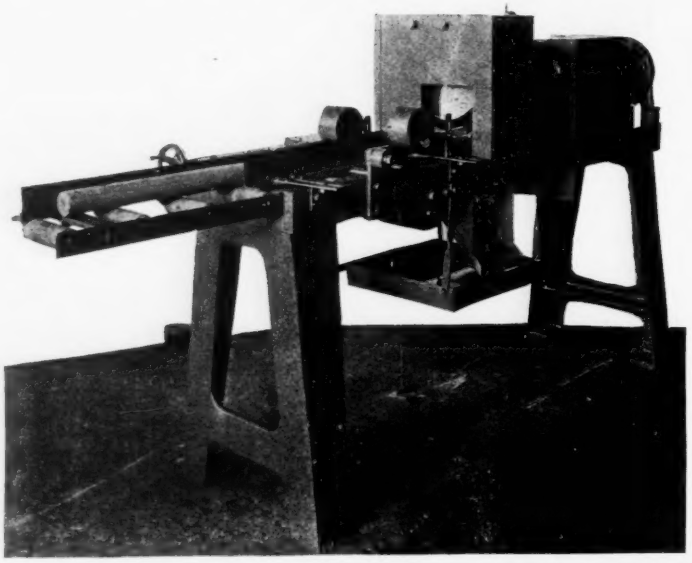
There are six different types of Skellysolve which are especially adapted to various uses in the rubber industry, for making rubber cements, and for many different rubber fabricating operations. Skellysolve offers many advantages over benzol, rubber solvent gasoline, toluol, carbon tetrachloride, etc. It will pay you to investigate Skellysolve. Write today.

SKELLY

SKELLYSOLVE

SOLVENTS DIVISION, SKELLY OIL CO.
SKELLY BLDG., KANSAS CITY, MO.

Slicer Machine for Extruded Stocks



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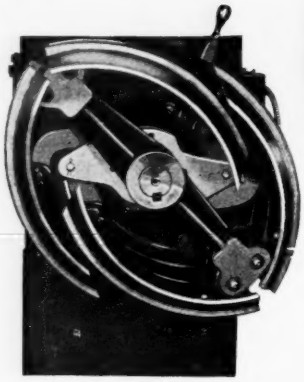

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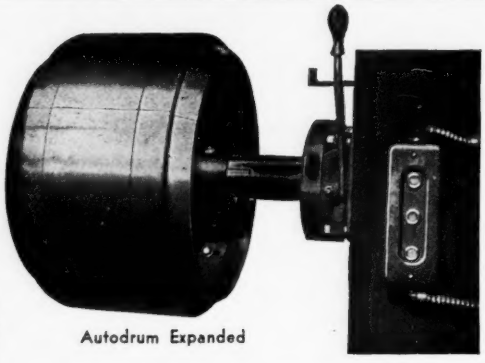

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* Patent Applied For

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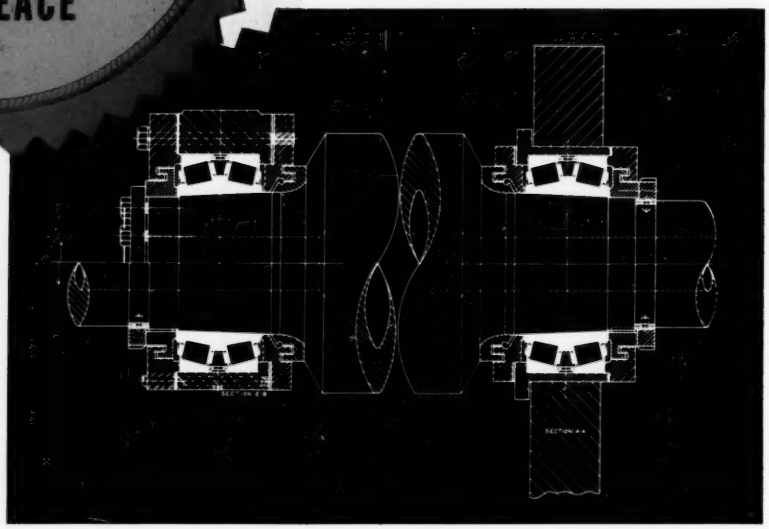

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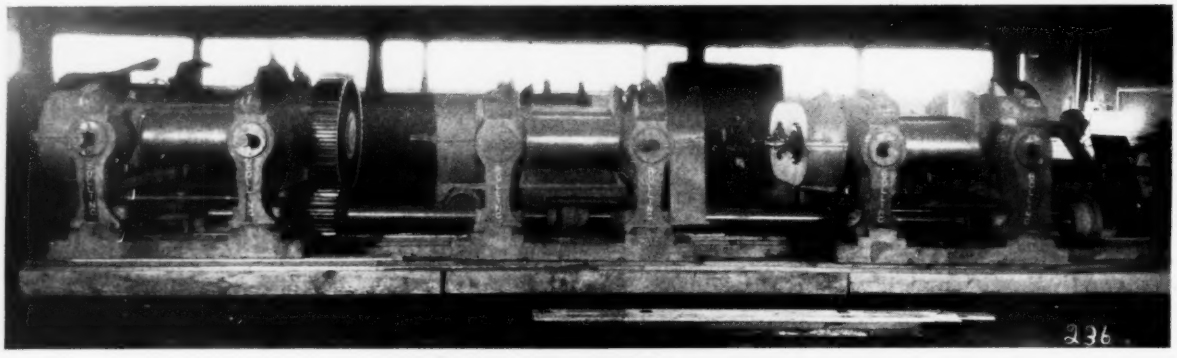

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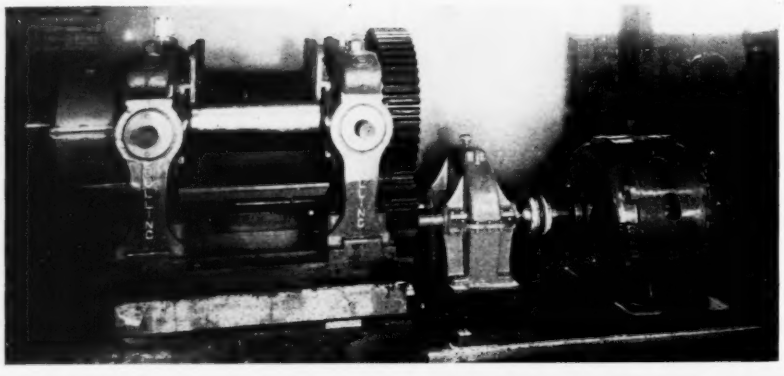

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[Another advertisement telling how different American industries are speeding up wartime production]

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TO WIN THE WAR

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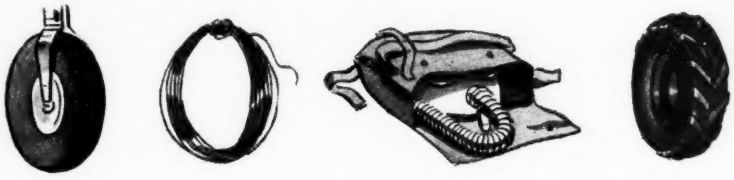

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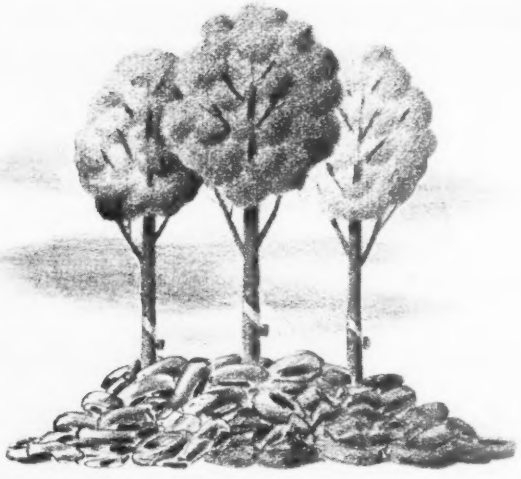

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The Compounding of Guayule Rubbers[1]

Effect of Accelerator-Curing Agent Combinations . . . . .

Ross E. Morris,[2] Robert R. James,[3] and Theodore A. Werkenthin[4]

PRESENT world conditions have made guayule rubber of definite interest to the rubber industry in this country. Whereas in the past guayule has been employed only for special purposes, this rubber is now being considered as a direct substitute for *Hevea* rubber in many applications. Guayule rubber has two advantages over synthetic rubbers—low cost and ease of processing.

Purpose of Investigation

Literature on the compounding of guayule rubber is very scarce. The authors have found only two papers which give any information on this subject, the work by Spence and Boone at the Bureau of Standards[5] and the work by Doering.[6] The former paper dealt specifically with the question of the quality of the rubber derived from the guayule shrub by suitable treatment, guarding against deterioration. The latter paper was concerned with the use of guayule rubber in tires and tubes. No systematic study of the effect of compounding ingredients was presented in either paper.

It is believed that comprehensive information on the compounding of the guayule rubbers will further the national defense effort by assisting rubber manufacturers in changing from *Hevea* rubber to guayule rubber where desirable, as the supply of the former rubber diminishes. Accordingly a program of tests is being pursued by the authors for the purpose of obtaining extensive data on the properties of the guayule stocks containing the more important compounding ingredients. The present paper embraces the effect of various vulcanization accelerators and curing agents. All tests were run on a comparative basis; the standards for comparison were similar stocks compounded from smoked sheet.

Types of Guayule Rubber

Three types of guayule rubber are available: namely, domestic deresinated, domestic resiniferous, and Mexican resiniferous.[7] The deresinated guayule rubber is obtained from the domestic resiniferous product by prolonged extraction with acetone or similar solvent followed by drying. Both domestic products are available in limited quantities at the present time because of restricted planting, but the Mexican product is more readily procurable since it is obtained from wild growth.

The domestic products employed in this testing program were supplied by the experimental plant of the Intercontinental Rubber Co., Salinas, Calif.; the Mexican product was one of the regular brands being supplied to the trade.

The guayule rubbers are characterized by comparatively high contents of acetone soluble substances and fibrous material. The deresinated guayule rubber, of course, contains less acetone soluble substances than the other guayule rubbers, but more than *Hevea* rubber. Table 1 gives the percentages of these substances in the guayule rubbers and *Hevea* rubber (prime smoked sheet) used in the compounding tests. It will be noted that the resin content of the Mexican guayule rubber is considerably higher than that of the domestic product.

TABLE 1. ACETONE SOLUBLE SUBSTANCES AND FIBROUS MATERIAL IN *Hevea* AND GUAYULE RUBBERS

	Acetone Soluble Substances	Fibrous Material
Prime smoked sheet	3.3%	0.0%
Domestic resiniferous guayule rubber	15.6%	0.31%
Domestic deresinated guayule rubber	6.1%	0.13%
Mexican resiniferous guayule rubber	25.9%	0.20%

[1] The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.
[2] Rubber technologist, Rubber Laboratory, Navy Yard, Mare Island, Calif.
[3] Assistant rubber technologist, Rubber Laboratory, Navy Yard, Mare Island.
[4] Materials engineer, Navy Department, Washington, D. C.
[5] Technological paper of the Bureau of Standards, No. 353, Sept. 23, 1927.
[6] *Ind. Eng. Chem.*, 26, 541 (1934).
[7] These rubbers will be identified in this paper by the abridged names, deresinated guayule rubber, domestic guayule rubber, and Mexican guayule rubber, respectively.

Formulas

The basic formula selected for the compounding tests is believed to be representative of a medium-hard, mechanical goods stock except that no antioxidant was included. The antioxidant was left out of the formula in order to appraise better the inherent resistance to aging of the guayule rubber stocks and the effect of accelerators on the resistance to aging of these stocks. The basic formula is given below.

Rubber	100.0
Semi-reenforcing carbon black*	50.0
Zinc oxide	5.0
Stearic acid	2.0

*Pelletex.

Eight accelerator-curing agent combinations were chosen as being typical of modern practice in the compounding of *Hevea* rubber stocks. The accelerators included representatives of all the popular types, and the curing agents included normal sulphur, low sulphur, and tetramethylthiuram disulphide with tellurium. The combinations and identifying numbers are listed in Table 2. It should be pointed out that mercaptobenzothiazole, when used with tetramethylthiuram disulphide and tellurium in combination No. 8 really acts as a retarder instead of an accelerator.

TABLE 2. ACCELERATOR-CURING AGENT COMBINATIONS

Combination No.	Accelerator	Amount per 100 Rubber	Curing Agent	Amount per 100 Rubber
1.	Mercaptobenzothiazole	0.8	Sulphur	2.5
2.	Dibenzothiazyl disulphide	0.8	Sulphur	2.5
	Zinc dimethyl dithiocarbamate	0.1		
3.	2-Mercaptothiazoline	0.5	Sulphur	2.75
	Butyraldehyde-aniline condensation product	0.1		
4.	Butyraldehyde-monobutylamine condensation product	0.5	Sulphur	2.5
5.	Diorthotolylguanidine	1.0	Sulphur	3.0
6.	Tetramethylthiuram monosulphide	0.2	Sulphur	2.0
7.	Mercaptobenzothiazole	0.5	Sulphur	0.75
	Dibenzothiazyl disulphide	0.5		
	Tetramethylthiuram disulphide	0.5		
8.	Mercaptobenzothiazole	1.0	Tetramethylthiuram disulphide	3.0
			Tellurium	0.5

Master batches were compounded from smoked sheet, deresinated guayule rubber, domestic guayule rubber, and Mexican guayule rubber, using the basic formula given above. The master batches were mixed on a 40-inch mill. Eight stocks were then compounded from each master batch, using one of the eight accelerator-curing agent combinations in each stock. The stocks were mixed on a 12-inch laboratory mill. All mixing operations were performed strictly in accordance with the standard methods of the A.S.T.M.[8]

The authors acknowledge that the sulphur ratios employed may not be sufficient for the guayule rubbers because of their high resin content. The effect of sulphur ratio on the physical properties of the guayule stocks will be the subject of further study.

Curing

Since it was proposed to carry out a comprehensive testing program on 32 stocks, it was not possible to perform all tests on each stock without unduly delaying the investigation. The time of cure at 287° F. for each stock, which gave optimum tensile strength, was selected as being the best cure for testing. Since tensile strength measurements were made on sheets 0.07 to 0.08-inch thick, thicker test specimens were given a longer cure; for example, the ¼-inch thick flexing specimens were cured three minutes longer, the ½-inch thick compression set specimens were cured five minutes longer, and the one-inch thick rebound specimens were cured 15 minutes longer.

The times of cure for optimum tensile strength are given in Table 3. In this table and in the charted data the following abbreviations are employed to designate the type of rubber in the stock:

Prime smoked sheet	SS
Domestic deresinated guayule	DG
Domestic resiniferous guayule	RG
Mexican resiniferous guayule	MG

TABLE 3. TIME OF CURE 287° F. FOR OPTIMUM TENSILE STRENGTH

Accelerator-Curing Agent Combination No.	Type of Rubber	Time of Cure at 287° F. for Optimum Tensile Strength Minutes	Accelerator-Curing Agent Combination No.	Type of Rubber	Time of Cure at 287° F. for Optimum Tensile Strength Minutes
1	SS	20	5	SS	30
	DG	20		DG	40
	RG	20		RG	30
	MG	30		MG	40
2	SS	5	6	SS	5
	DG	10		DG	10
	RG	10		RG	10
	MG	10		MG	10
3	SS	30	7	SS	5
	DG	40		DG	10
	RG	30		RG	10
	MG	40		MG	10
4	SS	30	8	SS	20
	DG	30		DG	30
	RG	30		RG	20
	MG	30		MG	30

It will be noted in Table 3 that the general tendency was for the smoked sheet stocks to cure the fastest, followed in order by the domestic guayule stocks, the deresinated stocks, and the Mexican guayule stocks.

Program of Tests

The following program of tests was selected as being of particular interest to manufacturers of mechanical goods:

TESTS ON UNVULCANIZED STOCKS

1. Plasticity at 212° F.—initial and after two hours at 212° F.

TESTS ON VULCANIZED STOCKS

1. Shore hardness—initial and after aging for 24 hours in oxygen bomb.
2. Tensile strength—initial, after aging for 24 hours in oxygen bomb, and after immersion for two months in distilled water.
3. Ultimate elongation.
4. Modulus at 300% elongation.
5. Permanent set.
6. Tear resistance—initial and after aging for 24 hours in oxygen bomb.
7. Rebound.
8. Resistance to flex cracking.
9. Compression set.

The oxygen bomb aging was performed at 158° F. under 300-pounds-per-square-inch oxygen pressure. Details on the other tests are given below.

Results of Tests

Processing. Processing details are always of major importance to the manufacturer. The behavior of the guayule rubbers during the mixing of the master batches on a 40-inch mill is recorded in the following paragraphs.

[8] Standard Methods of Sample Preparation for Physical Testing of Rubber Products; A.S.T.M. Designation: D15-39.

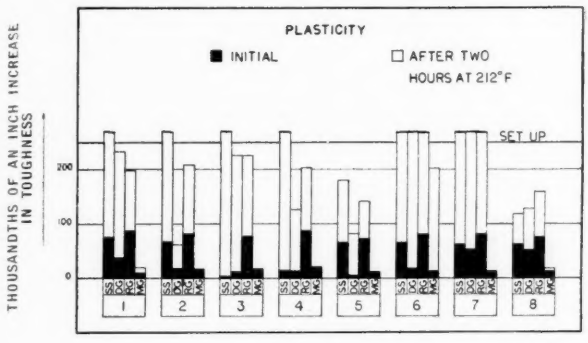


Fig. 1

Deresinated guayule rubber behaved like pre-broken-down smoked sheet. The master batch was mixed without any difficulty. The finished master batch had about as much nerve as double-broken-down smoked sheet.

Domestic guayule rubber broke down quite easily. The only difficulty noticed during the mixing operation was that the rubber had a tendency to break away from the front roll after most of the black had been added. The finished master batch possessed little nerve; it was soft and fairly tacky, but showed no inclination to stick to the back roll when sheeted off.

Mexican guayule rubber was extremely soft and tacky. It handled satisfactorily on a cold mill, but on a warm mill it stuck badly to the back roll. It also stuck to the operator's hands, mill knife, etc. The finished master batch stuck to galvanized steel so that it was necessary to use liberal quantities of soapstone or zinc stearate on the metal surface when sheeting out. Even the cured stock compounded from this rubber was quite tacky.

Plasticity. The purpose of the plasticity tests was to determine the relative stiffness of the stocks and their relative rates of set-up or scorching. For this purpose a Scott pedestal-type plastometer, with total weight of 10 pounds on the upper platen, was employed. Steam was blown through the hollow cavities in the platens of the plastometer in order to obtain a temperature of 212° F. on the surface of the platens. Small sheets of the stocks were plied to a thickness of 0.3- to 0.4-inch to make specimens for the test. The initial plasticity determination was made by inserting a specimen in the plastometer and lowering the upper platen until the rubber was compressed to a thickness of 0.250-inch between the upper platen and the pedestal. After a warm-up period of ten minutes, the upper platen was released. The thickness of the specimen after three minutes was taken as a measure of the toughness or stiffness of the stock.

In order to determine the rate of set-up of the stocks, specimens were placed in an air oven maintained at 212° F. At the end of two hours the specimens were removed, and their plasticity determined by the procedure described above.

The results of the plasticity tests are given in Figure 1.[9]

The charted plasticity data indicate that the smoked sheet stocks are more scorchy than any of the guayule stocks and that the deresinated and domestic guayule stocks are more scorchy than similar Mexican guayule stocks. It is interesting to note that the relative increase in toughness of the deresinated and domestic guayule stocks in the scorch test parallels the increase in toughness of similar smoked sheet stocks in most cases thus proving that these rubbers are affected in a like manner by a given A-C combination.

Perhaps the most significant information to be gained from the chart is the pronounced initial toughness of the domestic guayule stocks. Whereas the deresinated guayule stocks and Mexican guayule stocks might be troublesome to process because of excessive softness, the domestic guayule stocks should process almost as well as similar smoked sheet stocks.

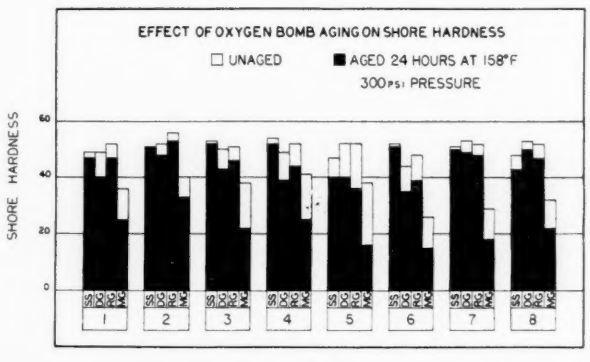


Fig. 2

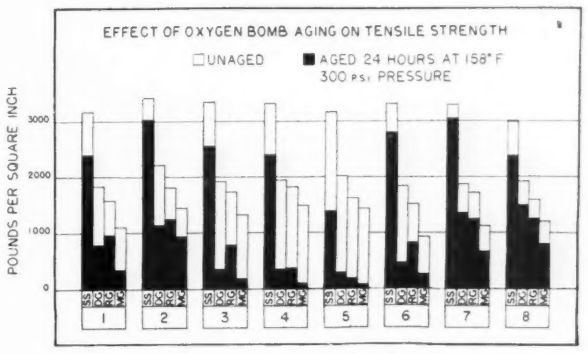


Fig. 3

Shore Hardness. The Shore hardnesses of the vulcanized stocks before and after aging in the oxygen bomb are given in Figure 2. The hardness measurements were made on specimens ½-inch thick.

The deresinated and domestic guayule stocks in most cases equal, or even exceed, the similar smoked sheet stocks in hardness. The Mexican guayule stocks, on the other hand, are all softer than the others, and they are more affected by the A-C combination used. The smoked sheet stocks generally resist aging better than any of the guayule stocks, and the deresinated and domestic guayule stocks are better than the Mexican guayule stocks in this respect. A-C combination No. 2 provides the greatest stability against aging for all the rubbers.

Tensile Properties. The tensile properties: namely, tensile strength, ultimate elongation, modulus at 300% elongation, and permanent set, are charted in Figures 3, 4, 5, and 6, respectively.

The tensile strengths of the deresinated guayule stocks average about two-thirds the tensile strengths of similar smoked sheet stocks. The tensile strengths of the domestic guayule stocks are 200 to 400 pounds lower, and the Mexican guayule stocks are 500 to 900 pounds lower than the tensile strengths of the deresinated guayule stocks. A-C combination No. 2 produced the highest tensile strengths for the smoked sheet and deresinated guayule stocks; this combination and combination No. 4 pro-

[9] The numbers below the base line in the charts indicate the accelerator-curing agent combination used. In the remainder of the paper the expression "accelerator-curing agent combination" will be abbreviated to "A-C combination."

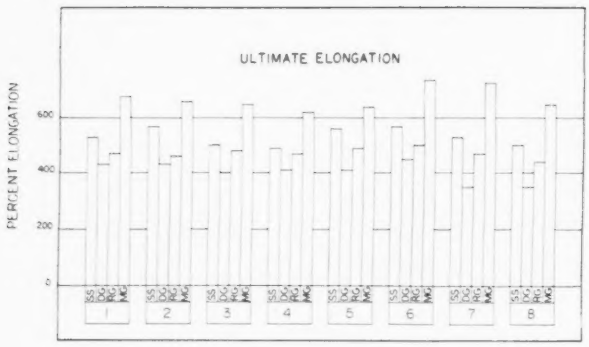


Fig. 4

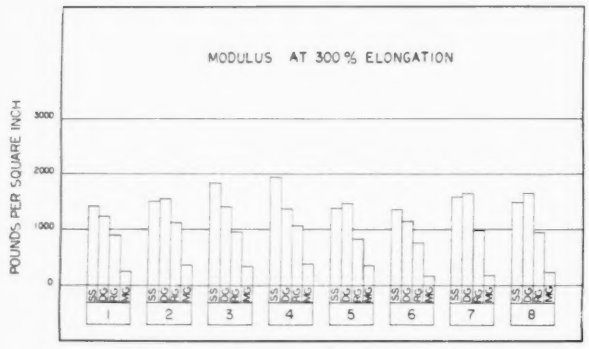


Fig. 5

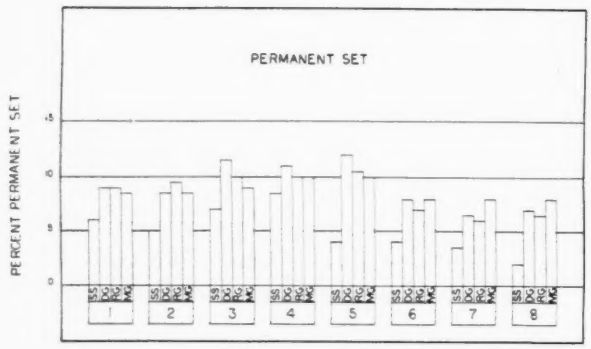


Fig. 6

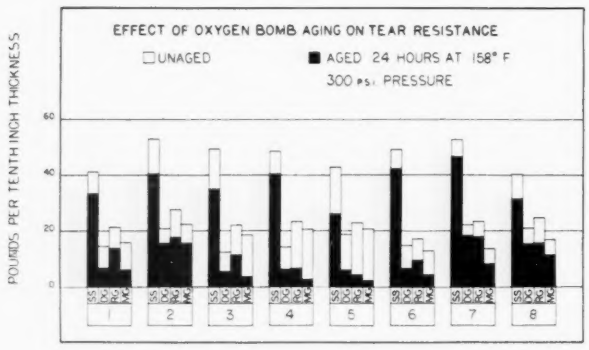


Fig. 7

duced the highest tensile strengths for the domestic and Mexican guayule stocks.

The Mexican guayule stocks exhibited the highest elongations at break, followed in order by the smoked sheet, domestic and deresinated guayule stocks.

The moduli at 300% were considerably affected by the A-C combinations. Combinations No. 3 and 4 produced the highest moduli for smoked sheet, but, surprisingly, the low-sulphur and no-sulphur combinations Nos. 7 and 8, respectively, produced the highest moduli for deresinated guayule rubber. Combinations Nos. 2 and 4 yielded the highest moduli for the domestic and Mexican guayule rubbers.

The permanent set measurements were made at 300% elongation according to the standard method of the A.S.T.M.[10] The smoked sheet stocks had lower permanent set than the corresponding guayule stocks. The permanent sets of the guayule stocks were about the same for a given A-C combination, not differing one from another by more than 2% (actual value). The low-sulphur and no-sulphur stocks of all the rubbers, A-C combinations Nos. 7 and 8, gave the lowest permanent sets.

Effect of Aging in Oxygen Bomb. The tensile strengths after aging for 24 hours in the oxygen bomb are given in Figure 3 together with the initial values. The percentage drop in tensile strength of the guayule stocks is much more severe than is obtained with the corresponding smoked sheet stocks, although the actual amount of drop is less in certain cases. Of the guayule stocks, the Mexican generally suffered the greatest deterioration, and the domestic the least. One normal sulphur formula, A-C combination No. 2, and the low-sulphur and no-sulphur formulas, A-C combinations Nos. 7 and 8, produce the best aging stocks for any of the four rubbers.

Effect of Immersion in Water. Dumbbell specimens were immersed in distilled water, maintained at a temperature of 85° F., for two months. They were tested for tensile properties immediately after removal from the water. It was thought that the presence of fibrous material might bring about the deterioration of the guayule stocks due to the rapid diffusion of the water into the interior of the rubbers.

It was found that the tensile strengths and elongations of all the stocks were very little changed by the immersion except in the case of the Mexican guayule stock containing A-C combination No. 7; the tensile strength of this stock dropped 16%.

The moduli at 300% elongation were more affected in every instance, particularly in the case of the guayule stocks. For example, the domestic guayule stock containing A-C combination No. 4 experienced a drop in modulus of 25%, although the tensile strength decreased only 2% and the ultimate elongation increased 6%.

Tear Resistance. The tear resistances before and after aging for 24 hours in the oxygen bomb are given in Figure 7. These tear resistances were measured according to the proposed method of the A.S.T.M.[11] with the modification proposed by Poules.[12] Poules found that more uniform results are obtained with one cut midway between the ends of the test piece than is the case if the usual five cuts are made.

It will be noted in Figure 7 that domestic guayule stocks have the best initial tear resistances among the guayule stocks. With two exceptions, the same can be said of the tear resistances after aging. However, the tear resistances of the smoked sheet stocks are about 100% greater than those of the corresponding domestic guayule stocks.

[10] Tentative Methods of Tension Testing of Vulcanized Rubber; A.S.T.M. Designation: D412-40T.
[11] Proposed Method of Test for Tear Resistance of Vulcanized Rubber; A.S.T.M., Aug., 1940.
[12] India Rubber World, 103, 5, 41 (1941).

The best tear resistances after aging for the guayule stocks were obtained with the normal-sulphur formula, A-C combination No. 2, the low-sulphur formula, A-C combination No. 7, and the no-sulphur formula, A-C combination No. 8.

Rebound. Rebound or resilience was measured with the Goodyear Healy rebound pendulum. An angle of drop of 20 degrees and a test piece size one inch by one inch by two inches were utilized. The data are charted in Figure 8.

The data show that the rebounds of the deresinated guayule stocks and domestic guayule stocks approach those of similar smoked sheet stocks; the former guayule stocks are the better. The Mexican guayule stocks have rebounds equal to approximately one-half the rebounds of similar smoked sheet stocks. The normal-sulphur formulas, A-C combinations Nos. 2 and 4, provide the highest rebounds for the four rubbers.

Resistance to Flex Cracking. The resistance to flex cracking due to bending was determined on the de Mattia tester. The basis for comparison was the number of flexures required to produce a crack through the specimen at the circular groove. The results are given in Figure 9.

Surprising results were obtained from the flexing tests. By far the best stock was the smoked sheet stock containing A-C combination No. 3, but exceptionally good resistance to flex cracking was exhibited by the Mexican guayule stock containing A-C combination No. 6. The latter stock was even somewhat better than the similar smoked sheet stock and very much better than the similar deresinated and domestic guayule stocks. With the exception of the stocks containing A-C combinations Nos. 3 and 4, the deresinated and domestic guayule stocks had poor resistances to flex cracking.

Compression Set. The results of the compression set tests under constant load are given in Figure 10. The procedure recommended by the A.S.T.M. was used.[13]

It is generally recognized that the compression set of a vulcanized rubber stock is greatly affected by state of cure. The cure for optimum tensile strength is usually not the cure for minimum compression set; consequently the values given in Figure 10 are not the best that can be obtained with the respective stocks. Nevertheless these values are considered to be suitable for the purpose of comparison.

It will be observed in Figure 10 that the smoked sheet stocks have the lowest compression sets except with A-C combination No. 8 where the compression set of the deresinated guayule stock equals that of the similar smoked sheet stock. It is very evident that the lowest compression sets for all the rubbers are obtained with the low-sulphur and no-sulphur formulas.

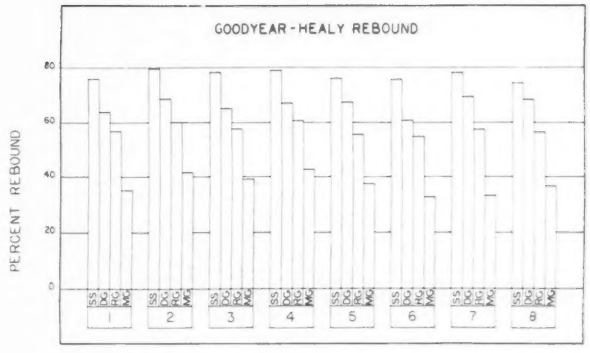


Fig. 8

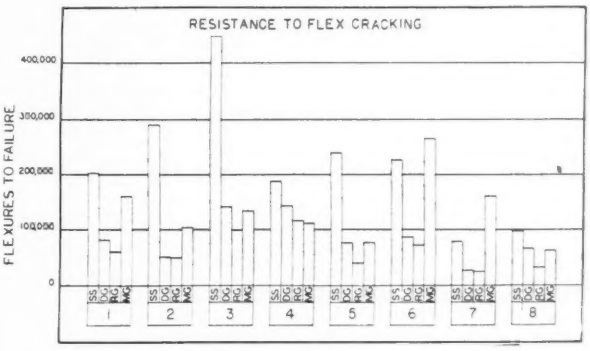


Fig. 9

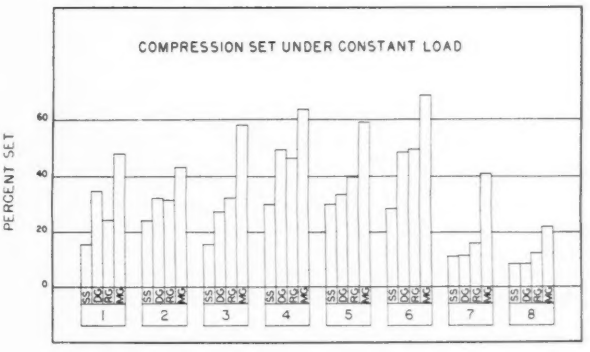


Fig. 10

Conclusions

The accelerator-curing agent combinations in most cases have the same effect on the three guayule rubbers as they have on smoked sheet. No accelerator-curing agent combination produces smoked sheet stocks or guayule stocks excelling in every property; each rubber must be specially compounded for the purpose in mind.

The authors conclude from the various test data reported above that stocks prepared from domestic deresinated guayule rubber do not show sufficient advantages over similar stocks prepared from domestic resiniferous guayule rubber to justify the extra expense involved in the preparation of the former rubber. On the other hand, stocks prepared from Mexican resiniferous guayule rubber are definitely of poorer quality than similar stocks prepared from the domestic products.

[13] Tentative Methods of Test for Compression Set of Vulcanized Rubber; A.S.T.M. Designation: D395-40T.

Acknowledgment

The authors wish to acknowledge the cooperation of Irwin H. Whitthorne in this investigation.

Correction

"Naftolen as a Plasticizer and Extender for Rubber in Carbon Black Compounds", in our February, 1942, issue, has an error. In the second column, page 475, the eighteenth line should read: "loaded with an *inactive* filler, tensile and abrasion approach", not "loaded with an *active* filler", etc.

Firestone High-Frequency Torsion Tester

THE high frequency torsion tester, developed in the Firestone physics research laboratory by W. F. Bartoe, was designed to measure independently the dynamic modulus and hysteresis loss of rubber stocks at frequencies as high as 10 cycles per second.

Referring to the accompanying photograph, the rubber test piece (1) is 0.375- by 0.375-inch by one inch to 2½ inches long. The test piece can be molded from experimental stocks or cut and buffed from tire treads or other rubber products. It is held in the rigid top clamp (2) and the rotating bottom clamp (3) by tightening the knurled nuts. The bottom clamp carries a disk (4) equipped with a sharp pointer, which terminates approximately $\frac{1}{16}$-inch from the surface of the movable chart carrier (5). The lower clamp and disk assembly is free to rotate within a ball bearing. It has been found that it is best to run this ball bearing dry, provided care is taken to avoid dust.

The chart mechanism consists of a light aluminum chart carrier (5), which is driven downward, through a rack and pinion arrangement, by means of a synchronous (Telechron) motor. A counter balance attached to the chart carrier is adjusted to permit the carrier to fall of its own weight in the multiple-roller ways when the motor drive is disengaged.

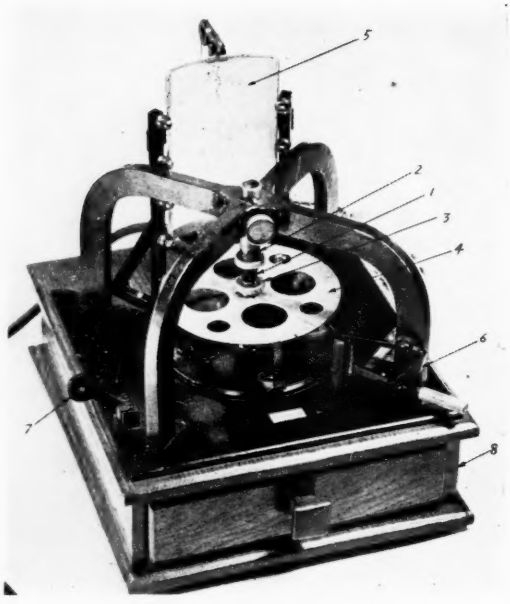
A combined catch and switch mechanism (6) is provided so that the disk may be held at an angle of 0.3 radian from the equilibrium position, against the restoring torque in the rubber test piece. If the catch mechanism is then released, the motor will begin to drive the chart downward; an interrupted electric spark will jump from the pointer through the Stylograph paper on the carrier, and the disk will be released to vibrate about its equilibrium position. The spark, in jumping from the pointer through the paper to the carrier, produces a trace which may be analyzed (since the chart speed is known and constant) to give the modulus of rigidity, natural frequency of vibration, and hysteresis loss per cycle.

A friction clutch mechanism on the motor drive permits pulling the chart up to the starting position. The chart may be run down without displacing the disk, and the spark will then trace the equilibrium position (or zero line) along the chart. In the case of stocks having a high hysteresis loss per cycle, the zero line will not be straight, but a curve determined by the amount of permanent set in the sample at the particular instant at which the inertial stress is operating. In the illustration, a typical damped sinusoidal record is shown in position in the chart carrier, which is in the upper or initial position. The logarithmic envelopes of the peaks have been drawn in to facilitate measurements.

A small pulley (7) and weight pan (not shown) are supplied to enable the measurement of the torque required to twist the disk around to the starting position. This latter equipment is used in determining the static modulus of rigidity. The transformer and spark coil are located within the box (8).

In order to calculate the natural frequency for a given stock, it is only necessary to measure the average wave length, as recorded by the chart, and, from a knowledge of the chart speed, the frequency is obtained.

The cyclic efficiency or the converse, hysteresis loss per cycle, is calculated from the ratios of the successive angular displacements. The formula for calculating the dynamic modulus of rigidity is given in Table 1, as well as the other calculating formulas.



Firestone Torsion Tester

TABLE 1. HIGH-FREQUENCY TORSION TESTER

Calculating Formulas

Static Modulus of Rigidity $\equiv G_s = \frac{2L}{\pi R^4}\,\frac{T}{\theta_s}$

Dynamic Modulus of Rigidity $\equiv G_d$

$$G_d = \frac{2L}{\pi R^4}\; I\left(4\pi^2 f^2 + \frac{K^2}{4I^2}\right)$$

Cyclic Efficiency $\equiv E = \frac{\theta_a}{\theta_{a-n}} = \frac{\theta_a}{\theta_{a+4}}$

Hysteresis Loss/Cycle $H = 1 - E = 1 - \frac{\theta_a}{\theta_{a+4}}$

Where

$L \equiv$ Length of Rubber Test Piece
$R \equiv 0.6 \times$ Sample Thickness
$I \equiv$ Moment of Inertia
$f \equiv$ Natural Frequency
$\theta_a \equiv a^{th}$ Angular Displacement
$\theta_{a+4} \equiv (a+n)^{th}$ Angular Displacement
$K \equiv$ Damping Constant $= \frac{4If}{n} \ln_e\left(\frac{\theta_a}{\theta_{a+n}}\right)$
$T \equiv$ Torque to Give Static Displacement θ_s

A fairly comprehensive study of the effect of bearing friction and windage losses was made in the development of this instrument. As the instrument is now used, bearing friction and windage do not contribute appreciably to the damping observed on the charts. The calculating for-

(*Continued on page* 611)

German Patents Relating to Vinyl Polymers—IV

M. Hoseh

IN CONTINUING this series of patent abstracts under new authorship, it has been decided to arrange the patents chronologically, according to date of granting instead of date of application which was the previous arrangement. Because of this, the patents will be given a new numerical sequence; thus the first patent below is designated as (1). EDITOR'S NOTE.

This patent (1)[1] describes a new and easier method for the polymerization of styrols, its derivatives and homologs. The ordinarily high temperatures required to polymerize styrols successfully are greatly lowered if the process is undertaken in the presence of HF. By regulating the amount of HF, products of varying qualities are obtained. If it is necessary, the polymerization can be conducted in the presence of such organic solvents as CCl_4, benzene, etc.; while the HF may be diluted with alcohol or water. The HF is recovered at the end of the process for reuse.

A new method for obtaining resin-like substances is described in this patent (2). According to this method, polymerizable compounds such as: vinyl ethers and esters, vinyl halides, phenyl vinyls, acrylic acid, its esters, cinnamic acid esters, etc., generally polymerizable compounds containing an olefinic double bond, are caused to react with ethylene-α-β-dicarboxylic acids or their anhydrides, e.g. maleic acid anhydride. The quantities of the reactants vary, and by choosing the reactants and their respective amounts products of different properties are obtained. Depending on their properties, the products have manifold uses: they are used as impregnating material, for lacquers, electric insulators, adhesives, and are valuable aids in the textile industry.

The following patent (3), which is an addition to the preceding one, improves the method of obtaining varied products technically very valuable. To obtain derivatives of the above described condensation products, the monomeric vinyl compounds are first condensed with ethylenedicarboxylic acid, and the condensation product transformed into the desired derivative. The carboxyl or the anhydride groups in the condensation product retain their reactivity and not only form alkali and alkaline earth salts, but they can be alkylated or amidified; they react with polyalcohols, e.g., glycols, glycerol, with polyhydric phenols, amines, etc. The various derivatives vary widely in their properties and thus in their uses.

New substances suitable for the preparation of lacs are described in this patent (4). Condensation products of maleic acid, or its derivatives, and unsaturated alcohols are mixed with polymers of compounds having the $H_2C{=}C<$ group. Among such polymers are the ethers and esters of polyvinyl and organic or inorganic acids, polymers of styrol, acrylic acid and their derivatives, divinyl, etc. The mixing is done as follows: the polymer, singly or mixed, is heated to 100-140° C., and the condensation product is added to it with constant stirring. If the polymer is too viscous, it is dissolved in a suitable solvent, the condensation product mixed in, then the solvent evaporated. The lacs prepared from these substances are very elastic and strong, they are good electric insulators and are resistant to moisture and light.

New condensation products of polyvinyl alcohols are described in this patent (5). According to it, polyvinyl alcohols are condensed with cyclic ketones in the presence of condensing catalysts, e.g., H_2SO_4. Similar results are obtained if, instead of a polyvinyl alcohol, is used a polyvinyl ester, provided the reaction is conducted so that the alcohol will appear as an intermediate. These condensation products are soluble in organic solvents and water, which property distinguishes them from the condensation products of polyvinyl alcohol and aldehyde.

A method for producing plastic condensation products of dihalogenated hydrocarbons of the paraffin series with polysulphides is described in the following patent (6). Compounds such as $C_2H_4Cl_2$ are treated with aqueous polysulphides in the presence of insoluble alkaline earth compounds. Very favorable results are obtained with 1% to 5%, on the basis of the polysulphide, of freshly precipitated $Ca(OH)_2$. Best results are obtained with polysulphides of the type $XS_{1.5\text{-}3.75}$, where X is an alkaline earth atom, or two alkali atoms.

Thermoplastics are obtained according to patent (7) by condensing alkyl vinyl ketones, e.g., polymethyl vinyl ketone, polymethyl vinyl ketone, etc., with aldehydes. The condensation is conducted in the presence of mineral acids. Suitable aldehydes for this process are formaldehyde, acetaldehyde, propionaldehyde, crotonaldehyde, benzaldehyde, etc. If the condensation is conducted in the cold and in the presence of much acid, the product is a white flaky powder soluble in organic solvents, and these solutions are suitable for the preparation of lacs, impregnating substances, thread, and films. The products of condensation under heat and pressure are insoluble in organic solvent; they are quite plastic and are advantageously pressed. Their properties can be modified by the addition of fillers, dyes, and plasticizers.

Patent (8), an addition to (6), describes an improvement of the method. The condensation is conducted in the presence of 10 to 80% of ethyl alcohol. This facilitates the dissolving of the hydrocarbon. Other alcohols, e.g., methyl, propyl, butyl, and acetone can be used for the same purpose.

A method to inhibit the separation of the polyvinyl ester in alcohol paste[2] at low temperatures is the subject of this patent (9). The method consists of adding 3 to 4%, but no more than 10% of water to the alcohol polyvinyl ester paste. Certain organic liquids will also prevent the separation of the paste at low temperatures.

An improvement of the method described in the German patent No. 540,552[3] is the subject of the following patent (10). To avoid deformation of articles pressed from vinyl polymers, these compounds are hardened by pretreating them at temperatures of 100° C. or more.

The saponification of mixed polymers, at least one component of which is a vinyl ester, is discussed in the next patent (11). The polymer is dissolved in a suitable solvent and then saponified. Depending on the nature of the

[1] For details on patents see end of this article.
[2] See patent No. 537,646 (52), INDIA RUBBER WORLD, Feb. 1, 1942, p. 471.
[3] Patent (41), *Ibid.*, Nov. 1, 1941, p. 158.

polymer, the nature of the saponifier, and the degree of saponification, various products are obtained having valuable technical applications.

The following patent (12) deals with the halogenation of aromatic polymers having a double bond in their side chain or in an added ring. Thus polystyrol or polyindene is dissolved in chloroform or CCl_4 and treated with Cl in the presence of a promoter such as I, $SbCl_5$, etc. The resulting products are purified with $NaHSO_3$ or NaOH from which solutions they can be recovered with the aid of steam or hot air. Depending on the size of the molecule of the polymers and the number of introduced halogen atoms, the final product will range from solid to oily consistency. The products are valuable for the preparation of lacs and coating substances, and they can be thermo-molded.

This patent (13) is an improvement in the method as outlined in (2) and (3). In it the polymerization products containing carboxyl radicals are heated with an organic compound containing hydroxyl radicals at approximately 100° C. Suitable hydroxyl compounds for this purpose are: glycol, glycerol, pentaerythritol, sorbitol, resorcinal, etc. The product is a resin-like substance resistant to water and alkalis which can be heat molded.

A new protective and embedding substance for luminescent paints is described in patent (14). Thus polystyrol, polymerized methylstyrols, ethylstyrols, vinyl naphthalenes, vinyl tetrahydronaphthalenes, etc., are used to protect luminescent paints from the detrimental influence of air, moisture, light, etc. These polymers are transparent and resistant to the atmosphere. They do not react with the sulphidic paints, but even enhance their brightness.

The next patent (15)[4] describes a method for producing valuable polymers of butadiene hydrocarbons. According to it, mono- or polyolefinobenzenes such as styrols, divinylbenzenes, etc., as well as their homologs are polymerized with hydrocarbons used in the preparation of rubber, such as erythritol and its homologs. Either of the components can be partly prepolymerized. Here again depending on the parent materials and the method of its preparation, the products have different properties and are valuable for sundry industrial uses, e.g., textile aids, thermoplastics, lacs, and many others.

An improved method for polymerizing vinyl ethers is given in the following patent (16)[5] whereby vinyl esters are readily polymerized with good yield and no hazard if the reaction is conducted in the presence of materials having a large surface area. Among such materials are bleaching clays, activated carbon, diatomaceous earth, finely subdivided metals of the first and eighth periodic group. Particularly good are bleaching clays, the water extract of which has a pH<7. The action of these materials is greatly enhanced by an addition of acid reacting substances such as: hydrohalides, alum, Al_2SO_4, $KHSO_4$, $ZnCl_2$, etc. The polymerization can be conducted in either the gaseous or liquid state. Patent (17), a continuation of (16), covers rapid and safe polymerization of vinyl ethers accomplished with the aid of boron halides, e.g., BF_3, and addition products with ethers or alcohols. Since only small quantities of boron halide addition product are needed, in many reactions no more than 0.001%, it is diluted with the corresponding alcohol or ether to a 2% solution. For this method temperatures of 40 to 60° C. are required, but reaction will take place also at lower temperatures.

Valuable derivatives of mixed polymers are obtained by a method described in patent (18). By this method mixed polymers containing free hydroxyl groups are treated with compounds capable of reacting with hydroxyls, such as compounds having reactive carboxyl, carbonyl, or keto groups. Among such compounds are carboxylic acids and anhydrides, aldehydes, ketones, alkyl chlorides, etc. Mixed polymers are such as are obtained by polymerizing together vinyl chloride and vinyl acetate, vinyl acetate and maleic acid, or styrol and vinyl ester. In the case that the mixed polymers contain no OH groups, they are added by saponifying the polymers.

The patent (19) gives a process for obtaining valuable mixed polymers by polymerizing together vinyl esters of higher fatty acids with vinyl esters of lower fatty acids, such as vinyl acetate, chloro-acetate, propionate, butyrate, etc. Instead of this latter group, can be used other polymerizable compounds having one or two conjugated olefinic double bonds. The polymerization is accomplished with the aid of light or heat. If desired, such catalysts as H_2O_2, organic peroxides, ozonides, perborates, percarbonates, Ag_2O, etc., can be used.

The impregnation of fabrics with polyvinyl alcohols is the subject of patent (20). Polyvinyl alcohol derivatives are dissolved in a suitable organic solvent, and the fabric steeped in it. Then the fabric is dried and treated with an alkaline or acid saponifier, and the ester is thus partly or totally converted to the polyvinyl alcohol. This process is particularly suitable for making brake linings.

Derivatives of acrylic acid polymers and their homologs and a method for their preparation are described in patent (21), which concerns the chlorination of individual or mixed polymers. The chlorination can be conducted in the solid or liquid state or in an emulsion. Suitable catalysts are metallic salts, preferably of Fe; metalloids—Br, I, P, Ar, S, etc.; and light. If necessary, heat and pressure can be used. The amount of Cl taken on determines the solubility and other properties of the product, and since the chlorination can be stopped at any desired stage, the properties of the product can be regulated.

[4] Addition to No. 570,980 (27). See India Rubber World, Sept. 1, 1940, p. 43.

[5] Addition to No. 524,189 (45). See India Rubber World, Feb. 1, 1942, p. 471.

Patent References

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(To be continued)

Structure, Properties, and Uses of Rubatex

Hans Pfleumer[1]

DURING recent years considerable progress has been made in investigating the unique properties of Rubatex, cell-tight expanded rubber, and in finding new fields of application for this material. A previous article[2] dealt with its history, commercial development, processing, general properties, and applications. The object of this article is to discuss in more detail the structure and specific properties of Rubatex and to describe and illustrate some of its newer applications, particularly those of current importance in military production.

Structure

Rubatex is a gas-tight cellular expanded rubber that is non-absorbent. It has sometimes been confused with sponge rubber, from which in its nature and composition it is entirely dissimilar. The essential difference between Rubatex and ordinary sponge rubber is that the former is composed of individual, completely enclosed cells with an unbroken wall structure, but sponge rubber is made up of interconnecting cells in a labyrinthine-like formation.

Rubatex and sponge types of expanded rubber are made in several varieties, and the structural formation of both depends upon the processing method. The polyhedral composition (see Figure 1) of Rubatex may be such that its cut surfaces resemble honeycomb. Or it may be composed of large or small globular cells or a mixture of both (see Figure 2). Figure 3 shows the mixed polyhedral and globular cell structure of Rubatex.

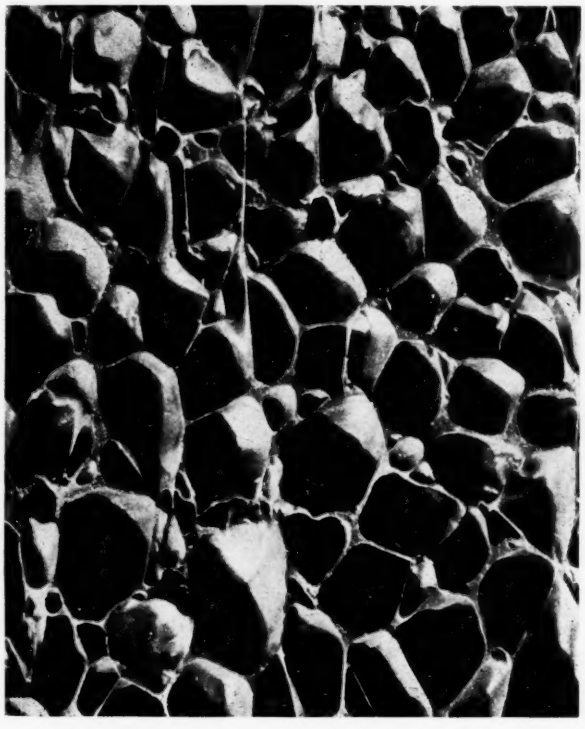

Fig. 1. Rubatex, Polyhedral Cell Structure, 12 Diameters

Fig. 2. Rubatex, Globular Cell Structure, 12 Diameters

Sponge, as in latex sponge made by beating, may show spherical cells, the porous walls of which are profusely perforated owing to evaporation of moisture (see Figure 4). Or sometimes the structure of sponge, if made by blowing the compound in a press under pressure and heat (see Figure 5), is deformed and ruptured to such an extent as to preclude any resemblance to a cellular structure. The material so processed is of the rubber sponge structure type. In contrast to Rubatex, such sponge rubber has water absorbing qualities which for many years have been the chief basis for its utilization.

The cell-tightness of Rubatex may be verified by subjecting a soft Rubatex and a sponge rubber specimen of equal size to a vacuum of about 25 inches Hg and noting the behavior of each (see Figure 6). The sponge remains normal in size, but the cell-tight rubber expands approximately 50% in each dimension, or to 3½ times its normal volume, because of the pressure differential within and without the closed cells.

Another simple test consists of placing a flat weight upon a sheet of both sponge and Rubatex. The weight

EDITOR'S NOTE: Rubatex is manufactured under patents owned and controlled by Rubatex Products, Inc., 420 Lexington Ave., New York, N. Y. This company acts only as a licensing unit, but includes among its functions extensive research and the assisting of licensees. In the United States licenses have been granted to the United States Rubber Co., New York, N. Y.; the Salta Corp. (Virginia Rubatex Division), Jersey City, N. J.; the Sponge Rubber Products Co., Derby, Conn.; and the Standard Products Co., Cleveland, O. In Canada a license to make Rubatex has been granted to the Dominion Rubber Co., Ltd., Montreal, P. Q. Rubatex is manufactured and sold in England under the name of Onazote by the Expanded Rubber Co., Ltd., Croyden. This firm is an affiliate of Rubatex Products, Inc.

[1] Rubatex Products, Inc., 420 Lexington Ave., New York, N. Y.

[2] "Rubatex, A Cell-tight Expanded Rubber." E. V. Osberg, INDIA RUBBER WORLD, Nov., 1937, pp. 37-39, 48.

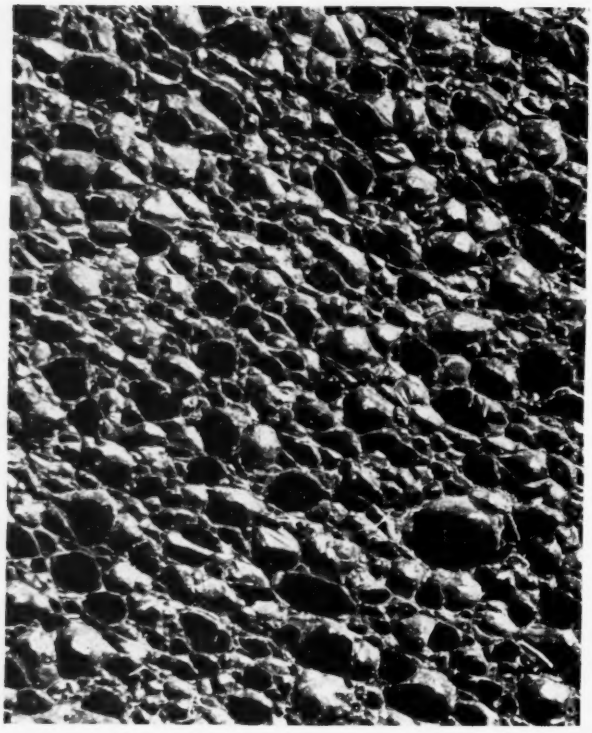

Fig. 3. Rubatex, Mixed Globular and Polyhedral Cell Structure, 12 Diameters

sinks into the sponge sheet, but remains floating upon the cell-tight sheet.

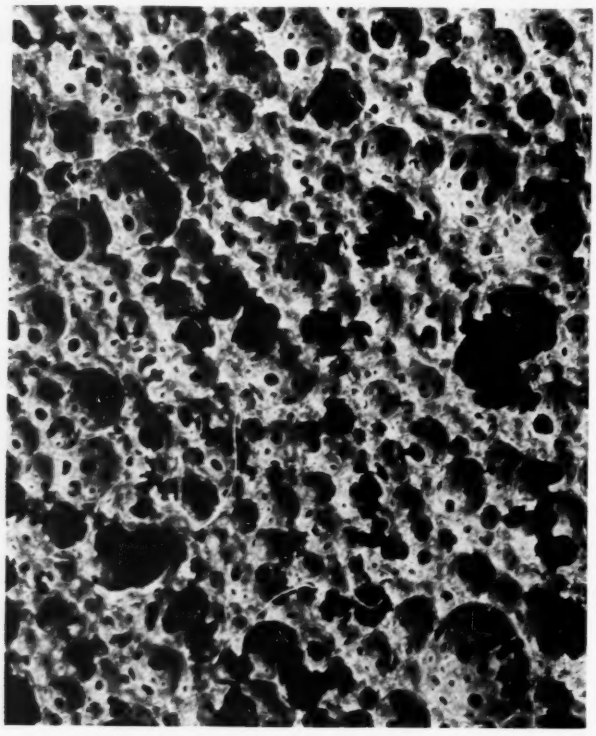

Fig. 4. Micro- and Macroporous Structure of Perforated Cells in Latex Sponge, 12 Diameters

Process

Since the introduction of Rubatex into this country in 1933, considerable progress has been made in the investigation of commercial processes for the manufacture of cell-tight rubber as well as in studies of its fields of application. From the extensive research activities that have been conducted there has evolved a structure of 37 patents with many additional pending applications.

There are essentially three processes of manufacture used, depending upon the desired characteristics of the end product: (1) external gassing; (2) internal gassing or chemical blow; and (3) combination external and internal gassing. In all these processes an inert gas which will not react with the rubber must be employed. Common inert gases, such as nitrogen and carbon dioxide, are used commercially.

Fig 5. Chemically Blown Sponge Rubber with Macroporous Structure, 12 Diameters

External gassing was the basis of the first successful commercial process. In this process the rubber compound is placed in a specially designed mold, with the volume of rubber such that the mold is substantially, but not completely filled. In the gassing chamber the rubber is subjected to gas pressures up to 3,000 pounds per square inch and heat sufficient only for partial vulcanization. During this stage the rubber expands completely to fill the mold, but, as the rubber is confined, such expansion is limited, which action has an important bearing on the formation of cell-tight rubber. After removal from the mold, the rubber expands under the influence of the internal gas pressure and is then shaped and completely vulcanized in conventional equipment.

One of the problems of this process is that the very large and bulky gassing chambers required make it extremely difficult to heat the rubber uniformly throughout to produce a uniform partial cure. This difficulty was

solved by partially vulcanizing the rubber before placing it in the gassing chambers, in specially designed autoclaves. Partial vulcanization here must be very carefully controlled; otherwise an overcure might result that would interfere with gas penetration in the subsequent step. Although this modified external gassing process requires an increase in the pressures employed for saturating the rubber with gas, it insures a greater degree of uniformity in the end product.

The second basic process utilizes chemicals that generate a gas which saturates and expands the rubber in its confining mold. This process has the advantage of not requiring the large expensive gassing chambers needed in the first process. Gas is generated chemically by (1)

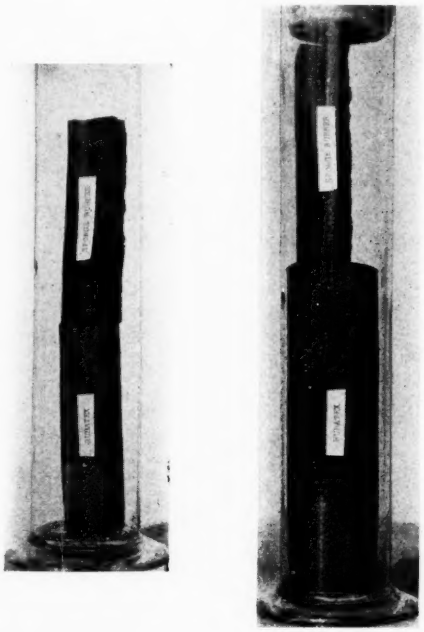

Fig. 6. The Cell-Tightness of Rubatex Is Apparent When, as in This Test, Equal Sized Specimens of Sponge Rubber and Rubatex Are Subjected to Vacuum. Samples Are Shown at Atmospheric Pressure (Left). Under Negative Pressure of 25 Inches Hg, Rubatex Has Expanded to 3½ Times Its Normal Volume (Right)

decomposition, as by the use of diazoaminobenzene, which upon heating liberates nitrogen gas, and (2) by chemical reaction, as exemplified in the production of nitrogen gas by the reaction of salts, such as sodium nitrate and ammonium chloride. The chemicals used are restricted to those which generate inert gases at temperatures approximately the same as that necessary for partially vulcanizing the rubber. If the gas were released at a temperature below that required for partial vulcanization, the gas would escape through the rubber before being entrapped.

The third process, which combines internal and external gassing, has the merits of each, but eliminates their respective disadvantages. In this process the rubber compound, mixed with the chemical that liberates the gas at partial vulcanization temperatures, is placed in a gassing chamber which need not operate at the high pressures previously employed. Gas is admitted to the rubber externally at relatively low pressures, and heat is applied to produce internal gas and partially to vulcanize the rubber. The external gas acts as a barrier against escape of the gas generated chemically so that the partial vulcanization temperature is not so critical and need not be so carefully controlled with relation to the gas evolution temperature,

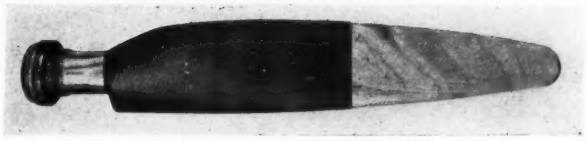

Fig. 7. Rubatex Fairings Molded to the Lower Part of Airplane Propeller Blades

as in the case of the pure chemical blow process. Impregnation of the rubber in this process is obtained by both external gas and chemically generated internal gas.

Purposes and Uses

The practical purposes for which Rubatex can be utilized and their applications are summarized in Table 1; while its properties as compared with those of materials of the same general functional characteristics are listed in Table 2.

Table 1. Classification of Uses and Applications of Rubatex

	Soft Material	Hard Material
Shock Absorption	Kneeling mats for ship builders Cushioning under tile floor in aircraft Mattresses for hospital operating tables Pads and mats Athletic and sporting gear Boat fenders Bumpers for carpet sweepers	
Sound Insulation	Vibration dampening Reduction of sound transmission in airplane cabins and other places	Telephone booths Airplane cabins
Heat Insulation	Ice cube containers Dry ice blankets Suits for watch standers Tubing in electrical refrigerators to insulate cold tubes	Tank insulation for breweries Refrigerator cars and trucks Ice boxes Ice cream peddling boxes Pipe covering Roof and wall insulation for houses Floors for food storage buildings
Electric Insulation	Diathermic pads	Airplane panels
Buoyancy	Life-saving belts Swimming suits Boat seats Life rafts	Life preservers and rafts Pontoon bridges Ring buoys Submarine floats Fishnet floats Water closet floats
Miscellaneous	Gaskets Upholstery trim, cord Weather stripping Road expansion joints	Structural members Propeller fairings Light density space filler

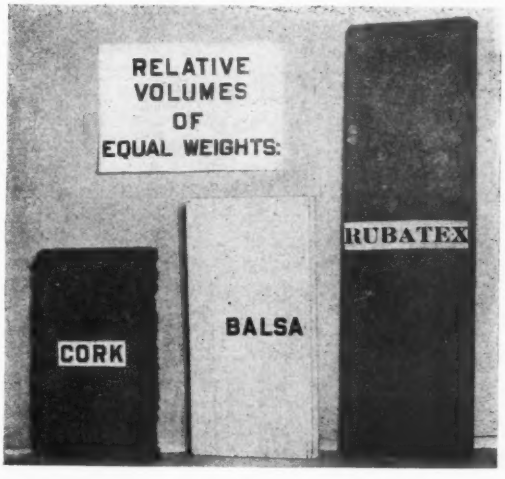

Fig. 8. These Boards Are of the Same Weight, Thickness, and Width. The Difference in Length Demonstrates the Superior Lightness of Rubatex

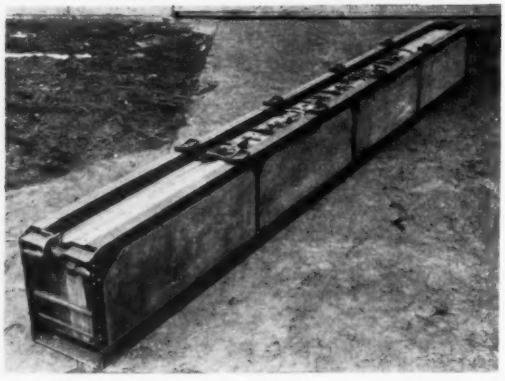

Fig. 9. Four Rubatex Flotation Units Placed in a Steel Frame Form a Pontoon Bridge Section. Each Unit Holds Seven Hard Rubatex Boards

TABLE 2. COMPARATIVE PROPERTIES OF CONVENTIONAL MATERIALS

Material	Density Pounds per Cu. Ft.	Buoyancy, Pounds per Cu. Ft.	Absorptivity	Thermal Conductivity (K-Factor) 80° to 90° F.
Balsa Wood ...	7 to 10	Becomes waterlogged	Hygroscopic	0.38 to 0.67
Rock Wool	7 to 14	.....	.....	0.27 to 0.48
Kapok	1 to 6	Of short duration	.....	0.24 to 0.30
Animal Hair Board	.....	.....	.....	0.29 to 0.32
Cork and Cork Board	10 to 17	Deteriorates 54.5 to 47.5 in sea-water	Slight (when protected)	0.25 to 0.34
Vulcanized Rubber	58 to 68	.....	.....	0.99 to 2.29
Sponge Rubber.	12 to 32	Slight, due to trapped air	Extreme	0.35 to 0.72
Soft Rubatex ..	6	Surface seawater only 58.5	Not appreciable	0.27
Hard Rubatex..	4.5	Moderate depths 60	Not appreciable	0.223 and as low as 0.20
Ebonite Rubatex (resistant to compression)	10 to 15	Submarine (deep sea) 50 to 54	Not appreciable	

The hard type of Rubatex can be reenforced for use as structural members in aircraft. After a costly series of experiments it has been adapted for use on airplane propeller blades (see Figure 7). It has been found that Rubatex is practically the only available satisfactory material, and such propeller fairings are now in production by the largest propeller manufacturer in the United States.

Hard Rubatex is also produced in standard board form for flotation purposes. Its superior lightness is evident if compared with samples of materials of equal volume or weight (see Figure 8). Such material for marine use can be made as light as 4½ pounds per cubic foot which provides an approximate lifting power of 60 pounds in sea water. This lifting power is greater than that of any other practical flotation material. Cork, which has an average weight of 13.5 pounds per cubic foot, will buoy 51 pounds so long as it remains substantially dry and does not become waterlogged. Because Rubatex is non-absorbent to all practical extent, it need not be painted with lead as does cork, and slight damage such as holes or broken edges does not decrease its buoyancy. Nor does its lifting power diminish after many years of use because no appreciable water absorption occurs over such a period of time. Hard board Rubatex in special frames is now used in constructing pontoon bridges (see Figures 9 and 10). Sections of such material are also joined into mooring buoys and life rafts.

The use of Rubatex has been proposed for filling out the empty spaces in aircraft wings to aid in flotation on water landings and to place between the bulkheads of vessels as an aid to buoyancy.

For submarine use at depths of 200 and 250 feet where water pressure is 88 and 110 pounds per square inch respectively, hard Rubatex flotation material is made of a density of from 10 to 15 pounds per cubic foot to resist crushing force and remain buoyant at those pressures. Its lifting power is, under these conditions, 50 to 54 pounds per cubic foot. Soft Rubatex would be compressed into a thin sheet even under much less severe pressure. Nevertheless on water surface soft Rubatex is extremely valuable as a buoyant material for life-saving jackets, swimming suits, rings, cushions, and boards, which may also serve as resilient seats. Jackets for Navy watch-standers are made by placing ¼-inch thick Rubatex sheets between the surface cloth and lining and trousers are made with ⅛-inch thickness of Rubatex between the lining and outer cover. The complete suit gives an 18 pound lift in salt water.

As a low-temperature heat insulation material Rubatex, particularly in the hard form, is utilized because of its extremely low K-factor (see Table 2). Because its density is low, its heat capacity is minimal. Rubatex is almost non-hygroscopic, therefore its insulating value does not change over long periods of time. The low K-factor is made possible by the extreme subdivision of the cellular material. The cells can be filled with a gas of lower K-factor than air or nitrogen such as carbon dioxide. Rubatex may readily be made non-radiating by application of reflecting foil to the surfaces.

The soft variety of Rubatex in sheet form is of somewhat higher K-factor. It is used for certain cold insulating purposes where sharp bending is required, as in electric refrigerator cold tubes.

Its main advantage lies, however, in requirements where high elasticity and resilience are needed. The soft sheet can be compactly squeezed without taking any appreciable compression set because of the gas pressure's counter action within the cells. Therefore it can be used in leak-proof fuel tanks where its sealing action is much quicker than that of materials now used which depend for their sealing action solely upon the property of swelling in the solvent. The high resiliency of soft Rubatex also accounts for its shock absorbing qualities, and it is extensively used for boat bumpers, fenders, aircraft vibration dampers, and as protective equipment for sports and games in which sudden and forceful impact is likely to occur. But it is also satisfactory for very slow compressive forces such as are common in road expansion joints.

Rubatex in rigid board form as a structural material has advantages over some materials similarly used. It

(Continued on next page)

Fig. 10. Rubatex Pontoon Bridge in Use

Peak Production Requires Motor Preparedness

Frank V. Faulhaber

UNDER present conditions the rubber products manufacturer, more than ever, must be adequately prepared for those unforeseen emergencies if the plant's production is not to be jeopardized. Priorities make necessary more preparedness, with machinery, equipment, and materials, with incident proper maintenance. This is of particular significance as respects the plant's electric motors. Many times it is difficult to obtain the right type of motor, especially on short notice. Even when the plant has a duplicate motor, considerable valuable time is often entailed until the new equipment is efficiently set up and operations are again running to schedule.

When the manufacturer does provide spare motors to take up the slack quickly, this equipment is not always taken care of properly. An electric motor is a valuable mechanical unit of delicate characteristics, capable of efficient service; yet it cannot be expected to provide maximum service if it is not given proper care and maintenance.

So many times the plant's substitute motor equipment is stored in places difficult of access. It is considered that thus it will be out of the way, unimpeding anyone. Later it is a wearisome task to haul out a desired motor, involving more time and energy than tip-top efficiency would dictate. Meanwhile plant operations are disrupted, if not shut down altogether. Today it would seem a foremost requisite to accord special attention to motor storage so that a given unit can instantly be found, be set up speedily, without appreciably retarding the output.

An initial step should be to keep pertinent records of the plant's motors, including such information as source and date of purchase, installation, repairs, size, type, for what purpose, and other vital memoranda the manufacturer may deem of possible later use.

A forehanded procedure is to have in readiness at least one extra motor of each size in use. Only the manufacturer can best appreciate the handicap under which a plant often operates on compromising on a motor not exactly suited for the purpose. Waste and inefficient production attends. An additional motor of correct type eliminates delay.

The plant's spare motors should be stored in a dry place, never in damp basements, or in rooms where extreme temperatures may affect the insulation. Whenever a motor unavoidably has been subjected to moisture, the windings should be thoroughly dried before starting service. When the size of the apparatus does not make it inconvenient, the windings can be baked dry in an oven. Otherwise a current can be passed through the windings. The temperature, preferably, should be increased gradually. When uncertain of the serviceability of the equipment, and in order to forestall possible disappointments, the wiser course may be to assign the job to a special expert.

Adverse factors often govern the life of an electric motor. For instance, excessive dust may result in quicker depreciation. Modern electric motors are solving many of the plant's worries; yet perfection is still to be achieved. In any case, whether the motor is open type or enclosed, it should be stored in a clean, dust-free place. Excessive vibration, steam and oil vapors, and corroding fumes all prove detrimental. Once a suitable storage is provided, a motor preferably should be protected by some proper covering, impervious to outside atmosphere and deleterious influences. Stout rubber, canvas, and other similar shieldings give good protection.

Many times it is necessary to convey spare motors a considerable distance when making installation; thus it becomes desirable to have the proper transferring equipment so as to facilitate the work with minimum confusion and time loss. The larger motors can be kept on skids or trucks easily maneuverable; the smaller ones can be stored on racks. This point warrants special consideration especially in those plants where frequent motor changes and installations are necessary.

Coincident with good motor storage it is expedient to give due attention to bearings, brushes, oil, and kindred materials so that the plant will have ready, in satisfactory, peak condition, the correct additional equipment for each requirement. Improper oil should not be used. The incorrect oil too frequently accounts for the correct motor not functioning right.

Rubatex

(*Concluded from preceding page*)

can be reenforced not only upon the surface, but during its manufacture a board may be fortified internally to increase greatly the flexural and compression strength. Such strengthening is obtained by wire mesh or other material around which the compound flows during vulcanization. Unlike other materials Rubatex can be expanded during the last stages of vulcanization and therefore will fill empty spaces of structural parts, reenforcing them and increasing the low-temperature insulation. During this process it can be bent into curved shapes so that the space is completely filled.

The compression strength of Rubatex has been demonstrated by subjecting a hard disk, 4½ inches diameter by 1¼ inches in thickness and of a density of 13.5 pounds per cubic foot to a compression force of 275 pounds per square inch. The sample withstood this pressure over an area of three square inches. The same disk, which was made by the chemical blow process, withstood a hydrostatic pressure of 200 pounds per square inch.

Hard Rubatex is non-shrinking and fire resistant. These qualities, in addition to the properties previously mentioned, for both types which are rat-proof and termite-proof, suggest the superiority of cell-tight rubber to many other materials of similar applications.

This article has covered specific, but diversified properties and proven applications of Rubatex, but the physical properties here outlined in respect to shock absorption, sound, heat, and electric insulation, waterproofness, and buoyancy suggest many untried military and civilian uses. Only a few among these may be listed: puncture-proof aircraft tires; one-piece life-saving suits to keep the wearer dry, comparatively warm, and unsubmerged; bomb-shock vests and headgear as protection from concussion; and sleeping bags which offer warmth, effective cushioning, vermin protection, and easy sterilization.

Supplementary Order No. M-15-b-1 to Restrict the Use of Rubber[1]

IT IS hereby ordered that:

940.5 SPECIFICATIONS:

(a) *Applicability of Supplementary Order No. M-15-b (Section 940.3).* This Order is issued pursuant to paragraph (d) of Supplementary Order No. M-15-b (Section 940.3) issued by the Office of Production Management. All definitions and all other provisions of Supplementary Order No. M-15-b shall apply to this Order as fully as though set forth herein. Nothing in this Order shall be construed to permit the use of Rubber or Latex in the manufacture of any products except as permitted by Supplementary Order No. M-15-b or by special directions issued by the Director of Industry Operations.

(b) *Specifications for certain rubber products.* No Person shall use Rubber, Latex, or reclaimed rubber in the manufacture of any product included in the Lists enumerated below and attached hereto except in accordance with the specifications therein prescribed; such specifications to be effective as to any product or class of products as of the effective date of this Order except where otherwise specified in the appropriate list (Provided that such restrictions shall not apply to the manufacture of products to fill War Orders or other purchase orders placed by or for the account of any other department or agency of the Government of the United States, unless otherwise provided as to say product or class of products in the appropriate list):

(1) Hose and tubing of the kinds listed	List 1
(2) Conveyer, elevator and flat transmission belts and belting of the kinds listed	List 2
(3) Occupational protective clothing (other than footwear and gloves) and rubberized fabric for firemen's and policemen's clothing	List 3
(4) Jar rings	List 4
(5) Plain oxfords and laced-to-toe gym bals	List 5
(6) Waterproof boots, pacs, arctics, gaiters and overshoes	List 6
(7) Tire, tire casings, tire tubes and capping stock and compounds thereof	List 7
(8) Bicycle tires	List 8
(9) Tires, tire casings and tire tubes to fill War Orders	List 9
(10) Fire hose and mill hose	List 10

(c) *Effective date.* This order shall be effective as of the date of its issuance.

(P.D. Reg. 1, amended December 28, 1941, 6 F.R. 6880; W.P.B. Reg. 1, Jan. 26, 1942, 7 F.R. 561, E.O. 9024, Jan. 16, 1942, 7 F.R. 329, E.O. 9640, Jan. 24, 1942, 7 F.R. 527; Sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session.)

Issued this 11th day of February, 1942.

J. S. KNOWLES
Director of Industry Operations

LIST 1

Specifications for the manufacture of certain types of hose and tubing.

The following products may be manufactured only in accordance with these specifications and shall contain no Rubber or Latex:

Description of Product	Specifications Where Reclaimed Rubber Is Used: Minimum Inside Diameter	Maximum Outside Diameter	Color	Pressure Test
(1) Low pressure spray hose	3/8"	11/16"	Black	250 pound per square inch 10-minute hold on 3-foot sample
(2) Curb line and garage air hose	1/4"	5/8"	Black	
(3) Curb line and garage air hose	3/8"	3/4"	Black	
(4) Fire extinguisher tubing	3/8"	3/4"	Black	250 pound per square inch 10-minute hold on 16-inch sample
(5) Garden hose, 1-ply (The manufacture of 1-ply only is permitted)	5/8"	1"	Black	300 pound per square inch burst
(6) Car heater hose, 1-ply (The manufacture of 1-ply only is permitted)	5/8"	31/32"	Black	200 pound per square inch burst

(7) Automotive radiator hose shall be black only with a maximum wall gage of 3/16".

LIST 2

Specifications for the manufacture of certain types of conveyer, elevator, and flat transmission belts and belting.

(1) Conveyer belts and belting and elevator belts and belting shall be manufactured in two grades only, as follows:
  (a) Grade A, having a 2500-3000-pound cover tensile and a 16-19-pound friction.
  (b) Grade B, having a 800-1000-pound cover tensile, a 12-15-pound friction and no skim coats, and shall have black covers only.
(2) All belts and belting designed for conveying food and grain shall be manufactured in Grade B only.
(3) All belts and belting designed for conveying food may have a cover other than black in color.
(4) Flat transmission belts and belting shall be manufactured in two grades only, as follows:
  (a) Grade A, having a 20-24-pound friction.
  (b) Grade B, having a 12-15-pound friction and no skim coats.
(5) All belts and belting designed to transmit power to any Farm Machinery and Equipment (as defined in Preference Rating Order No. P-95) shall be of a Grade B quality, except designed to transmit power to hammermills.
(6) Where flat transmission belts and belting are manufactured in a color other than black, no more Rubber shall be consumed than would be consumed in black belts and belting of an equivalent grade.

LIST 3

Specifications for the manufacture of occupational protective clothing (other than footwear and gloves) and rubberized fabric for firemen's and policemen's clothing.

(1) Compounds used in the manufacture of the above products shall not contain more than 16% Rubber by weight.
(2) Single texture rubber-surfaced and friction-lined material for firemen's coats shall not contain more than 18 ounces of such compounds per square yard.
(3) Single texture rubber-surfaced materials for policemen's coats and occupational jackets, pants, hats, aprons, and coats shall not contain more than 13 ounces of such compounds per square yard.
(4) Double texture rubber-surfaced material for occupational protective clothing shall contain not more than 12 ounces of such compounds per square yard.
(5) Single texture rubber-surfaced material for occupational double-coated aprons shall contain not more than 20 ounces of such compounds per square yard.

LIST 4

Specifications for the manufacture of jar rings.

(1) Compounds used in the manufacture of jar rings shall contain not more than 10% Rubber by weight and shall be such as to produce not less than 11,000 gross of rings from each long ton (2,240 pounds) of rubber.
(2) Rings shall be cut 12 to the inch.
(3) Rings may have a single lip.
(4) With respect to internal diameter, width of flange, tensile strength, and ultimate elongation, rings shall meet minimum requirements of dimensions, strength and elongation as set forth in Federal Specification ZZ-R-351.

LIST 5

Specifications for the manufacture of plain oxfords and laced-to-toe gym bals.

(1) These products shall have tops of fabric only, and Rubber shall be used only for outsoles, boxings, toe caps, toe guards, bonderizers, compounds for inside bottom work.
(2) The average amount of Rubber per pair used in the manufacture of these products shall not exceed the indicated weights in the case of the following types:

Type	Maximum Average Weight of Rubber (in Pounds)
Men's	.25
Boy's	.20
Youth's	.15
Women's	.20
Misses'	.15
Child's	.10

LIST 6

Specifications for the manufacture of waterproof boots, pacs, arctics, gaiters, and overshoes.

(1) All such products shall be manufactured in a black color only.
(2) No Rubber shall be used for label plasters.
(3) Production shall be confined to the following types, and the average amount of Rubber per pair used in the manufacture of each type shall not be greater than the indicated maximum weight:

	Average Weight of Rubber (in Pounds) Maximum
Boots	
Men's Short	1.25
Women's Short	.75
Men's Storm King	2.00
Men's Hip	2.30
Pacs	
Men's 12" Toplace Pac	1.05
Men's Lumber Overs, Half Heel	.80

[1] Title 32—National Defense, Chapter XI—War Production Board, Subchapter B—Division of Industry Operations, Part 940—Rubber and Products and Materials of Which Rubber Is a Component.

LIST 6 (*Cont'd*)

	Average Weight of Rubber (in Pounds) Maximum
Arctics	
Men's 5-buckle Rubber Midweight Bal	1.15
Men's 4-buckle Rubber Midweight Bal	1.05
Men's 4-buckle Cloth Farmweight Blucher	.90
Men's 4-buckle Height Lightweight Bal-Rubber	.75
Boy's 3-buckle Height Lightweight Bal-Rubber	.62
Youth's 3-buckle Height Lightweight Bal-Rubber	.53
Women's 4-buckle Height Lightweight Bal-Rubber	.54
Men's 4-buckle Height Lightweight Bal-Cloth	.65
Gaiters	
Women's 2-snap Rubber	.30
Misses' 2-snap Rubber	.30
Child's 2-snap Rubber	.27
Rubbers	
Men's Storms and/or Semi-Storms	.60
Boy's Storms and/or Semi-Storms	.50
Men's Storms and/or S.A. Overs (full lined)	.35
Boy's Storms and/or S.A. Overs (full lined)	.30
Youth's Storms and/or S.A. Overs (full lined)	.25
Women's Storms and/or S.A. Overs (full lined)	.25
Misses' Storms and/or S.A. Overs (full lined)	.20
Child's Storms and/or S.A. Overs (full lined)	.20

LIST 7

Specifications for the manufacture of tires, tire casings, tire tubes, and capping stock and compounds therefor.

(a) Compounds

Description of Product Type	Grade	Maximum % by Volume Rubber	Whole Tire Reclaimed Rubber
(1) Tread and capping stock compounds	A	73	0
	B	59.5	17.5
	C	47.9	31.4
	D	40.4	41.3
	E	26.0	57.0
	F	0	89.3
(2) Passenger friction compounds	A	93.8	0
	B	78.0	15.2
	C	59.8	34.2
	D	43.2	50.3
	E	18.8	73.1
	F	0	90.2
	FF	6.4	85.0
(3) Truck friction compounds	A	88.5	0
	B	77.0	9.3
	C+	68.4	21.7
	C	59.8	34.2

Variations from the above specifications are permitted as follows:

Rubber	plus 0	minus 2
Whole tire reclaimed rubber	plus 0	minus (not limited)

In the event that no friction compound or tread compound in use by any Person on January 26, 1942, contains as large a percentage of Rubber as specified above, such Person shall not use or adopt the grade A friction composed of the grade A tread compound without the prior approval of the Director of Industry Operations.

The specification set forth in this subdivision (a) shall become effective not later than February 16, 1942.

(b) Tire Casings and Solid Tires

The friction and the tread, respectively, of each of the classes of tire casings and solid tires listed below shall be made from one of the grades of compounds listed in subdivision (a) of this list, the appropriate grade of compound to be used for each such respective friction or tread being that hereinbelow specified therefor opposite the description or designation of such class (provided that in no event shall any such tire herein required to be made of both grade F friction compound and grade F tread compound contain more than one pound Rubber):

Description of Product	Compounds to Be Used: Passenger Friction	Tread
Passenger Friction		
(1) Passenger automobile tires—standard grade	F	F
(2) Passenger automobile tires—premium grade—size 7.50 and larger	B	B
(3) Passenger automobile tires—premium grade—size 7.00 and smaller	C	B
(4) Low pressure road building equipment tires	E	C
(5) Agricultural equipment tires—Garden Tractor	F	F
(6) Agricultural equipment tires—Implements and Tractors—size 6.50 and larger	E	C
(7) Agricultural equipment tires—Implements and Tractors—size 6.00 and smaller	F	F
(8) Motorcycle tires	C	A
(9) Mileage tire—taxi	C	C
(10) Industrial penumatic tires	D	C
(11) Industrial solid tires	—	A
(12) House trailer tires	E	F
Truck Friction	Truck Friction	Tread
(1) Truck tires, 17"-24" rims, size 6.50 and smaller	C+	C
(2) Truck tires, 17"-24" rims, size 7.00 to 7.50 inclusive, 8-ply and less	C+	C
(3) Truck tires, 17"-24" rims, size 7.00 to 7.50 inclusive, more than 8-ply, and 7.50-20 8-ply standard grade	A	C
(4) Truck tires, 17"-24" rims, size 7.00 to 7.50 inclusive, more than 8-ply, and 7.50-20 8-ply premium grade	A	A
(5) Truck tires, 17"-24" rims, size 8.25 and larger—standard grade	A	C
(6) Truck tires, 17"-24" rims, size 8.25 and larger—premium grade	A	A
(7) Truck tires, 13"-16" rims, 8-ply and less	C	C
(8) Truck tires, 13"-16" rims, more than 8-ply	A	C
(9) On-highway equipment heavy service tires, 8-ply and less	B	C
(10) Off-highway equipment heavy service tires, more than 8-ply	A	A
(11) Mileage tires, city buses	B	C
(12) Mileage tires, inter-city buses	A	A

The specifications set forth in this subdivision (b) shall become effective not later than February 16, 1942.

(c) Capping Stock

Capping stock of each of the classes listed below shall be made from one of the grades of compounds listed in subdivision (a)(1) of this list, the appropriate grade of compound to be used for each such class being that hereinbelow specified opposite the description or designation of such class:

Description of Product	Tread Compound to Be Used
1—Capping Stock, 14-32 gage and smaller	E
2—Capping Stock, 16/32 gage and larger	A or C
3—Capping Stock, 12/32 and 14/32 gage, Hawkinson die sizes only	A or C

Capping stock may be manufactured only in gages of 10/32, 12/32, 14/32, 16/32, 18/32, 20/32, 22/32, and larger.

The specifications set forth in this subdivision (c) shall become effective not later than February 2, 1942.

(d) Maximum Material Volume of Tire Tubes

No tire tube of any of the classes listed below shall be manufactured with a material volume in excess of the volume specified for such class as set forth below opposite the description or designation of such class:

Description of Product Type	Size	Maximum Material Volume (in Cubic Inches)
Passenger automobile tire tubes	5.50-16	51.2
	CD 16	57.8
	6.50-15	66.6
	7.00-15	72.2
	D 16	72.
	7.50-15	89.4
	7.50-16	93.2
	A 20/21	42.8
	B 17/18	46.9
	C 17	56.1
	7.00-17	75.2
	7.50-17	93.4
Truck tire tubes 15" and 16" rim	6.00-16	65.
	6.50-16	75.
	7.00-15	85.
	7.00-16	89.
	7.50-15	103.
	7.50-16	108.
	9.00-16	191.
	10.00-16	220.
Truck tire tubes	6.00-20	75.
	6.50-20	102.
	7.00-20	135.
	7.50-20	175.
	8.25-20	197.
	9.00-20	235.
	10.00-20	300.
	11.00-20	350.
	12.00-20	450.
	13.00-20	525.
	14.00-20	670.
Agricultural equipment tires	4.00-12	25.3
	5.00-15	38.6
	6.00- 9	36.8
	6.00-16	59.0
	DM-16	70.5
	6.50-32	137.8
	FM 24	153.5
	8.50-10	0
	9.00-28	223.0
	HM 28	302.0
	KM 28	414.0
	5-40	92.5
	5.5-40	92.5
	6-40	118.0
	7-32	112.0
	8-32	157.0
	9-32	220.0
	10-28	242.0
	11-28	302.0
	12-30	385.5
	13-30	440.0
	14-30	498.0
	15-30	595.0

Variations from the above maximum volume shall be permitted to the extent of minus 3%.

Sizes not specifically set forth shall have maximum volumes proportional to the sizes listed.

In the event that the maximum herein permitted for a tube of a given type and size manufactured by any Person on the effective date of this Order is less than the maximum indicated above, such Person shall make no change in the maximum volume of such tube as then manufactured by him without the prior approval of the Director of Industry Operations.

The specifications set forth in this subdivision (d) shall become effective not later than March 2, 1942.

LIST 8

Specifications for the manufacture of bicycle tire casings and tire tubes.

(1) No bicycle tire casing (designed for use with a separate tube) shall contain more than 1.5 ounce of Rubber.

(2) No bicycle tire tube shall contain more than 6 ounces of Rubber.

(3) No bicycle single tube casing (tire and tube is one piece) shall contain more than 7.5 ounces of Rubber.

(4) In those instances in which lightweight (26" x 1⅜") tire casings and

tubes are manufactured to equip new bicycles, either the tire casing or tube may exceed the respective limits set forth in (1) and (2) provided the total weight of Rubber in a tire casing and tube combined does not exceed 7.5 ounces.

LIST 9

Specifications for the manufacture of tires, tire casings and tire tubes to fill War Orders.

(a) Compounds used in the manufacture of tires and tire casings to fill War Orders shall be prepared in accordance with the specifications set forth in subdivision (a) of List 7 attached to this Order.

(b) The friction and the tread, respectively, of each of the classes of tire casings and solid tires listed below shall be made from one of the grades of compounds listed in subdivision (a) of said List 7, the appropriate grade of compound to be used for each such respective friction or tread being that hereinbelow specified therefor opposite the description or designation of such class:

Description of Product	Compound to Be Used	
	Passenger Friction	Tread
Passenger Friction		
(1) Passenger automobile tires—size 7.50 and larger	B	B
(2) Passenger automobile tires—size 7.00 and smaller	C	B
(3) Airplane tires, 4-ply and less	B	B
(4) Airplane tires, more than 4-ply	A	A
(5) Motorcycle tires, 18" and 19" rim	C	A
(6) Odd-size tires, sizes 4.00-12 and 6.50-10	C	C
(7) Industrial pneumatic tires	D	C
(8) Industrial solid tires	—	A
Truck Friction	Truck Friction	Tread
(1) Truck tires, 17"-24" rims, size 6.50 and smaller and 7.00-20 8-ply	C+	B
(2) Truck tires, 17"-24" rims, size 7.00 to 7.50, inclusive, 8-ply and less, except 7.00-20 8-ply	B	B
(3) Truck tires, 17"-24" rims, size 7.00 to 7.50, inclusive, more than 8-ply	A	B
(4) Truck tires, 17"-24" rims, size 8.25 and larger, 8-ply and less	B	B
(5) Truck tires, 17"-24" rims, size 8.25 and larger, more than 8-ply	A	B
(6) Truck tires, 13"-16" rims, sizes 6.50 and smaller	C	B
(7) Truck tires, 13"-16" rims, size 7.00 and larger, 8-ply and less	B	B
(8) Truck tires, 13"-16" rims, size 7.00 and larger, more than 8-ply	A	B
(9) Run flat combat tires	A	A

(c) The skid depths of tires with mud- and snow-type treads shall be as follows:

Tire Size	Actual Mold Measurements in Inches
8.25-10	.585
9.00-13	.62
6.00	.50
6.50	.52
7.00	.535
7.50	.56
8.25	.585
9.00	.62
10.00	.645
11.00	.67
6.00	.50
6.50	.52
7.00	.535
7.50	.56
8.25	.585
9.00	.62
10.00	.645
11.00	.67
12.00	.70
13.00	.74
14.00	.80

15 and 18" .....

20, 22, and 24" rims .....

Variations from the above measurements shall be permitted to the extent of .01-inch plus or minus throughout the mold.

(d) The outside diameters of tires with mud and snow type treads shall be as follows:

Tire Dimension		Outside Diameter in Inches—Inflated Tires	
Diameter	Section	Minimum	Maximum
16" rims	6.00	28.60	28.80
	7.50	31.40	31.60
	9.00	35.00	35.30
	10.00	36.50	36.90
20" rims	7.00	35.60	35.90
	7.50	36.60	38.90
	8.25	38.10	38.40
	9.00	40.10	40.50
	10.00	41.00	41.50
	11.00	42.80	43.30
	12.00	44.20	44.70
	14.00	48.30	48.90
24" rims	14.00	52.30	52.90

(e) Standard tread radii shall be between 80% and 95% of the maximum cross-section width of The Tire & Rim Association's standard tire sections.

(f) None of the specifications contained in subsections (c), (d), and (e) above shall be construed to make any change in present dimensions of airplane tires.

(g) Maximum material volumes of tire tubes for passenger automobile tires and truck tires shall be subject to the limitations for those types of tubes as set forth in subdivision (d) List 7 attached to this Order.

(h) No tire tube of any of the classes listed below shall be manufactured with a material volume in excess of the volume specified for such class as set forth below opposite the description or designation of such class:

Description of Product Type	Size	Maximum Material Volume (in Cubic Inches)
Combat	6.00-16	65
	7.50-16	120
	9.00-16	190
	7.50-20	160
	8.25-20	190
	9.00-20	220
	10.00-20	250
	10.00-22	275
	11.00-20	318
	12.00-20	370
	14.00-20	525
Lend-Lease Regular	9.00-13	145
	10.50-16	250
	12.00-20	450
	13.50-20	670
Run Flat (Rubber-Bead-Lock)	7.00-18	95
	8.25-10	97
	9.00-16	165
	9.25-16	150
	10.50-16	210
	10.50-20	235
	12.00-20	335
	13.50-20	400

Variations from the above maximum volumes shall be permitted to the extent of minus 3%.

Sizes not specifically set forth shall have maximum volumes proportional to the sizes listed.

(i) *Effective Date.* These specifications shall become effective as follows:

(1) With respect to subsections (a) and (b) with the effective date of this Order.

(2) With respect to subconnections (c), (d), and (e), at the earliest possible date for each type and size of tire casing specified, depending on length of time required to obtain changed or new molds.

(3) With respect to subsection (g) and (h), not later than March 2, 1942.

LIST 10

Specifications for the manufacture of fire hose and mill hose.

(1) The following specifications (which, with respect to the use of Rubber, are identical with Federal Emergency Alternate Specifications E-ZZ-H-451a) shall apply to the manufacture of fire hose and mill hose.

(2) Fire hose and mill hose shall be manufactured only in the following sizes and the maximum amount of Rubber per 100 feet for each size shall not be greater than the amount specified for each size as follows:

Nominal Size	Maximum Amount of Rubber Permitted, per 100 Feet
1½ inch	4 pounds
2½ inch	7 pounds
3 inch	8.5 pounds
3½ inch	10 pounds

(3) The rubber lining shall be made either from calendered sheets of not less than three plies lap-jointed and vulcanized into one solid body, or from a single-ply extruded tube. The lap joints of calendered tubes shall be as small as is consistent with best manufacturing practice.

(4) The rubber lining shall be of a thickness not less than .04-inch at any point when measured on specimens buffed just to the point where the fabric impressions left by the jacket are removed.

(5) Each set of hose couplings shall be provided with three rubber gaskets of good quality. One gasket shall fit accurately the swivel of the couplings, and one (not less than ⅛-inch thick) shall be placed under the end of each expansion ring. When the coupling is made up snugly, as in service, the gasket in the swivel shall not be compressed to such an extent as to project beyond the inside surface of the coupling.

(6) The hose shall have an internal diameter as shown by a tapered plug gage of not less than the nominal size of the hose, except that in the case of 1½-inch hose, the internal diameter so measured shall not be less than 2⅜-inches.

(7) Unless otherwise specified, hose shall be furnished in lengths averaging not less than 50 feet, measured from back to back of couplings and under a pressure of 10 pounds per square inch. No length before sampling shall be less than 48 feet.

(8) The hose with couplings attached shall meet the following hydrostatic proof pressure test requirements without leakage in the hose or at the couplings or breaking any threads in the jacket.

	Numerical Requirements for				
	Single Jacket		Double Jacket		
	1½-Inch	2½-Inch	1½-Inch	2½-Inch	3 and 3½-Inch
Test pressure for initial requirements—pounds per square inch			10	10	10
Test pressure—psi	300	300	400	400	400
Test pressure for kink test—pounds per square inch			350	350	250
Elongation at test pressure—maximum %			8	8	8
Twist to right—maximum degrees per foot			29	12.5	12.5
Twist to left—maximum degrees per foot			0	0	0
Warp—maximum inches			20	20	20
Rise—maximum inches			0	0	0

The kink test may be required on only one sample per 100 lengths.

A twist to the right is indicated by a clockwise rotation of the coupling, looking from the hose toward the coupling. A twist to the left is indicated by a counter-clockwise rotation. A maximum twist to the left of 2 degrees per foot will be permitted while pressure is being raised, but any final twist must be to the right.

Warp is defined as deviation from a straight line.

(9) A three-foot sample, when subject to a burst test while lying straight, shall not burst below the pressure specified in the following table:

Kind of Hose	Burst Pressure, Pounds per Square Inch
Single Jacket	450
Double Jacket	600

(*Continued on page* 582)

Retreaded and Recapped Tires Rationed

NATION-WIDE rationing of retreaded and recapped tires began Thursday, February 19, Price Administrator Leon Henderson announced February 11. It is quite probable, he added, that there will be no crude rubber available for retreading, except for the small number of vehicles already eligible to obtain new tires and tubes.

"The amount, grade, and type of 'camelback'—the rubber compound used to form a new tread on worn tires—manufactured is determined monthly by the War Production Board," Mr. Henderson stated. "A certain amount will be made each month to permit the retreading or recapping of truck tires. None will be available this month for the retreading of passenger-car tires and, perhaps none for the month of March. Events will dictate the future production of this material. OPA is providing regulations broad enough to ration as much camelback as the War Production Board can make available out of our limited rubber supply.

"It is possible, and even probable, that there will be no crude rubber available for retreading of passenger-car tires, except for those vehicles already eligible to buy new tires."

Rationing of retreaded and recapped tires, the process of retreading and recapping, and of all grades and types of camelback will be carried out by using the same machinery now employed to ration new tires and tubes. Tires for passenger cars, trucks, buses, farm implements, road-grading equipment, and motorcycles are all subject to the rationing regulations. These regulations have been revised substantially to encompass the new and greatly enlarged program, and copies already are in the mails for delivery to every local rationing board in the country. The program will be administered by the Office of Price Administration under a "directive" issued by Donald M. Nelson, chairman of the War Production Board. This directive has been supplemented to delegate to OPA the authority to ration camelback and retreaded tires at the wholesale level.

Two eligibility lists, designated A and B, are contained in the new regulations, List A, except for the addition of clergymen, is generally the same as it has been under the new tire rationing plan. List B is a new addition and is confined exclusively to vehicles eligible to apply for certificates for retreaded or recapped tires. No List B vehicle will be able to obtain a retread during February and, in the case of passenger cars, possibly during March also. List B truck-tire certificates will be issued only during the last several days of each month and then only if any retreads are left over after the demands of List A truck eligibles have been satisfied.

The B list has been made broad purposely so that the rationing boards may use whatever camelback is made available to provide for the numerous contingencies that arise in various sections of a country as large as the United States.

Complete February quotas by states, giving the amounts of new tires and tubes made available to eligible passenger cars, trucks, buses, and other vehicles, and the amounts of retreaded truck-size tires for the month were announced February 15.

The February quotas showed a sharp drop in the number of new tires allotted for trucks, buses, and other heavy vehicles, reflecting the newly added retread quotas. On an over-all basis, the number of new and retreaded tires available this month in truck sizes will be larger than the January quotas, which were confined to new tires alone.

As will be seen from List B, below, the eligibility classifications, are confined to passenger-car users, excepting for a single classification, "Trucks used for any important purpose, not included in List A." The importance of the truck will be determined in each case by the local boards in relation to the needs of the community. Retail milk and food deliveries in many areas are obvious examples.

"The eligible classes in List B are not automatically qualified to purchase retreaded or recapped tires", Mr. Henderson said. "The regulations require anyone on List B to establish to the satisfaction of the local board that his car is used exclusively on service essential to the community and to the nation. There will only be a comparatively few vehicles in each community that will be able to pass this test. And, with supplies of camelback severely limited, only a few of those who can qualify are likly to get retreaded tires.

"Whenever the rubber situation permits, the quotas will be increased so as to make retreaded tires available to a greater number of those persons on List B."

The complete eligibility lists in the revised regulations are as follows:

LIST A

(a) A vehicle which is operated by a physician, surgeon, visiting nurse, or a farm veterinary, and which is used principally for professional services;

(b) A vehicle which is operated by a regularly practicing minister of any religious faith and which is used principally in and is necessary to the performance of his religious duties;

(c) An ambulance;

(d) A vehicle used exclusively for one or more of the following purposes:
- (1) To maintain fire-fighting services;
- (2) To maintain necessary public police services;
- (3) To enforce such laws as relate specifically to the protection of public health and safety;
- (4) To maintain garbage disposal and other sanitation services;
- (5) To maintain mail services;

(e) A vehicle with a capacity of 10 or more passengers operated exclusively for one or more of the following purposes:
- (1) Transportation of passengers as part of the services rendered to the public by a regular transportation system;
- (2) Transportation of students and teachers to or from school;
- (3) Transportation of employes to or from any industrial or extractive establishment, power generation or transmission facilities, transportation or communication facilities, construction project, or farm, except when public transportation facilities are readily available;

(f) A truck operated exclusively for one or more of the purposes stated in the preceding sections or for one or more of the following purposes:
- (1) Transportation of ice and fuel;
- (2) Transportation of materials and equipment for construction or for mechanical, structural, or highway maintenance or repair;
- (3) Transportation by any common carrier;
- (4) Transportation of waste and scrap materials;
- (5) Transportation of raw materials, semi-manufactured goods, and finished products, including farm products and foods; *Provided*, That no certificates shall be issued under this paragraph for a tire or tube to be mounted on a truck used for transportation of commodities to the ultimate consumer for personal, family, or household use;

(g) Farm tractors or other farm implements other than automobiles or trucks, for the operation of which rubber tires or tubes are essential;

(h) Industrial, mining, and construction equipment, other than automobiles or trucks, for the operation of which rubber tires or tubes are essential.

LIST B

(a) A passenger car used principally to provide one of more of the following transportation services:
- (1) Licensed jitney, taxi, or similar transportation service to the general public;
- (2) Transportation of persons to enable them to render construction or mechanical, structural, or highway repair maintenance services;
- (3) Transportation of executives, engineers, technicians, and workers to and from, or within, such of the following as are essential to the war effort: power generation or transmission facilities, transportation or communication facilities, or agricultural, extractive, industrial, military, or naval establishments;
- (4) Transportation on official business of Federal, State, or local government employes engaged in the performance of government functions essential to the public health, safety, or the war effort;
- (5) Transportation of produce and supplies to and from the farm if an applicant operating such farm does not own or possess a truck or other practicable means of transportation;
- (6) Transportation of traveling salesmen who are engaged in the sale of farm, extractive, or industrial equipment, foods or medical supplies, the distribution of which is essential to the war effort;
- (7) Transportation of newspapers for wholesale delivery: *Provided*, That a passenger automobile to be eligible under this paragraph must be used exclusively for one or more of the purposes in this subsection (a);

(b) Trucks used for any important purpose not included in List A.

The effective date of the plan—February 19—was selected in order that all persons who now have tire carcasses in retreading establishments for retreading or recapping can arrange either to have the work finished before that date or get their old tires back. After February 19 no retreaded tires can be obtained, even though the work has been on order for some time and even though the worn tire is owned by the person who ordered the job, except against a certificate issued by the local board. Carcasses left for retreading, but on which work has not been completed by February 19, can be repossessed by the owner at any time. Persons having retread jobs on order should check immediately with their retreader so that any work not possible to finish by February 19 can be stopped before the old tread is buffed off.

As revised, the tire rationing regulations contain substantial changes from those under which new tires alone have been rationed.

It is now provided that only "new tire" certificates will be issued to List A passenger cars unless the "new tire" quota is exhausted, in which event a "retread" certificate will be issued if there is any passenger-car camelback available. Formerly a List A passenger car operator could not obtain a "new tire" certificate unless the board could be satisfied that the old tire could not be retreaded.

[1] But on February 18 local rationing boards were instructed not to accept applications or issue certificates for the purchase of retreaded or recapped tires for buses, trucks, and other heavy vehicles until February 23. The revised tire rationing plan went into effect, as scheduled, in all other particulars.

The change is necessary in order that as much as possible of any passenger-car camelback allowed to be made will be available to applicants who can qualify under List B. It is hoped that such essential categories as defense workers and others engaged in direct war work will thus be given some chance of getting a retreaded tire whenever camelback is available. Until now, with no restriction on retreads, pleasure cars and other unimportant vehicles have overburdened retreading facilities and crowded out workers in war plants. Whenever passenger-car quotas for camelback are established, in certain instances, some retreads may become available for rationing to taxicabs in communities where other public and private transportation facilities are absent or inadequate. If passenger-car retread quotas are set up, there will be no distinction drawn between List A eligibles and List B eligibles.

Truck tire eligibles in List A will not be given certificates to purchase any new tires unless their old tires cannot be retreaded. However the needs of List A truck eligibles must be satisfied in every case ahead of those of a truck on List B. List A trucks and other heavy vehicles can apply for retreads as soon as the plan becomes effective.

The former broad provisions regarding the purchase of so-called "obsolete" tires for passenger cars, which in general applied to tires for cars more than 10 years old, has been replaced by a provision prohibiting the sale of "obsolete" tires except to passenger cars on either List A or List B.

As is the case with "new tire" purchase certificates, the "retread" certificates are good for 30 days and can be exercised anywhere. If desired, a certificate holder either can buy a retreaded or recapped tire or have a worn tire retreaded or recapped. Any tire, replaced by a new or retreaded tire, assuming no "carcass" was provided, must be turned in.

Since OPA has established maximum prices for new tires and for retreads and the process of retreading, the certificates can only be exercised within the limits set by the applicable ceiling schedule. All dealers and retreaders are required to post these maximum prices prominently in their establishments.

The new regulations contain various dates governing the issuance of certificates by the local boards. It is stipulated that no certificates for the purchase of passenger car retreads can be issued until March 2, by which time it will be known whether or not any passenger-car camelback will be available for that month. The War Production Board has not permitted the manufacture of any passenger-car camelback using crude rubber during February, and there is virtually none available at the moment.

No certificates for List B truck retreads out of March quotas can be issued until March 25 and then only during the remaining days of that month. Applications for such certificates, however, can be filed between March 1 and March 20, and no application will be accepted after the latter date until April 1. The same procedure will be followed in each succeeding month as to truck retreads for List B vehicles, so that demands of List A vehicles can be taken care of first.

On and after February 19 and until March 1, no camelback can be consumed in retreading or recapping a passenger-type tire, and a special provision is included to prevent the use of truck-tire camelback for this purpose.

Although the new and retread tire portion of the rationing plan goes into effect on February 19, one important part of the regulations dealing with camelback manufacturers becomes effective on February 16.

Many camelback makers operate retreading facilities as a part of their business. The regulations state that on and after February 16 no camelback maker can use monthly in his own (or controlled) retreading facilities a percentage of camelback greater than the percentage of camelback produced by him and so used during the year 1941.

The effect of this prohibition, Mr. Henderson stated, is to insure that a substantial portion of the camelback that the War Production Board permits to be produced will be made available for sale to independent retreading establishments who otherwise might not be able to replenish their stocks. Numerous complaints of inequitable distribution of camelback have been received by OPA, the War Production Board, the Department of Justice, and the Patman Congressional Small Business Committee:

"It will be the policy of the Office of Price Administration to do everything possible to see to it that all retreading establishments get their fair share of available camelback", Mr. Henderson stated.

The mechanics by which a retreading establishment will be able to replenish his stock are simple. Every establishment having truck tire molds will be given an initial allotment of truck-tire camelback sufficient to bring the total truck-tire camelback in his possession to 750 pounds per truck mold. Those already possessing more than 750 pounds per truck mold will not be given any additional camelback, and, conversely, establishments with no inventory will receive the full amount. Applications for this initial allotment must be filed by retreading establishments by March 1 with the local rationing boards on forms that will be provided for this purpose. Purchases of camelback to make up the allotments must be completed by May 1.

Excepting for this initial allotment, the flow of camelback from manufacturer to retreader will follow the flow of the "replenishment part" or retread certificates issued to eligibles by the local boards. Sale of camelback by a manufacturer against the presentation of the "replenishment part" of a certificate is not compulsory.

However, Mr. Henderson said, if it is found that retreading establishments are unable to obtain their fair share of available camelback even though holding "replenishment" certificates, OPA may find it necessary to institute compulsory allocation of camelback.

Sales of camelback and retreaded or recapped tires back to suppliers (i.e. "upstream") are permitted without restriction.

No. M-15-b-1

(*Continued from page* 580)

(10) The hose shall meet the following tests with respect to the rubber lining:

(a) Tensile strength of at least 800 pounds per square inch when tested across the fold.

(b) Ultimate elongation of at least 300%.

(c) Tensile strength, as determined with test pieces ½-inch wide prepared from strips cut transversely across the fold which have been subjected to the action of dry heat of 158 degrees ± 2° F. for 96 hours, shall be not less than 75% of the strength before heating.

(11) The adhesion of the rubber lining to the jacket shall be such that a weight of 8 pounds suspended from a strip 1½ inches wide will cause separation at a rate not greater than one inch per minute. This requirement does not prohibit that construction wherein there is no adhesion between the jacket and lining along the fold, provided the surface over which there is no adhesion is not greater than 35% of the total surface.

Amendment 4 to M-15-b

AMENDMENT NO. 4 TO SUPPLEMENTARY ORDER NO. M-15-B TO RESTRICT THE USE AND SALE OF RUBBER.[1]

Supplementary Order No. M-15-b (Section 940.3) is hereby amended as follows:

1. By striking out subparagraph (a) (1) thereof and substituting therefor the following:

(1) "Rubber" means all forms and types of crude rubber (including crepe rubber for sole or any other purpose), but does not include balata, gutta percha, gutta siak, gutta jelutong, pontianak, reclaimed rubber, scrap rubber, or Latex.

This Order shall take effect upon the date of its issuance.

Issued this 19th day of February, 1942.

J. S. KNOWLSON
Director of Industry Operations

[1] Title 32—National Defense Chapter IX—Office of Production Management. Subchapter B—Priorities Division. Part 940—Rubber and Products and Materials of Which Rubber Is a Component.

Late Developments

No one may bring new tires or tubes into the United States either for use or for resale except under express authority of the OPA, according to a ruling contained in a letter sent February 20 to the Commissioner of Customs by Leon Henderson, OPA administrator.

All stocks of chlorinated rubber in the United States, except those going into specified uses, were ordered frozen on February 23 by J. S. Knowlson, Director of Industry Operations.

On February 25, Arthur Newhall, chief of the WPB rubber branch, and R. R. Guthrie, chief of the textile branch, issued a joint statement that rubber would no longer be available for the thread used in making corsets, girdles, and other foundation garments, or any type of elastic bands used in clothing. An order putting this statement into effect was scheduled for early issuance. The order would make provisions for the production of surgical-type garments.

Price Schedule No. 87—Scrap Rubber[1]

THE war being waged with the Japanese Empire makes uncertain the future shipments of rubber from the Far East. In order to conserve for military and essential civilian purposes the rubber stockpile already accumulated in this country, it has been necessary to curtail sharply the consumption of rubber in the manufacture of products not essential to the immediate national defense. This restriction upon the processing of crude rubber is expected to cause a marked increase in the use of such materials as reclaimed rubber which serve as substitutes for crude rubber. The demand for scrap rubber, the material from which reclaimed rubber is made, may be expected to expand sharply, thereby producing grave danger of further price increases.

Scrap rubber prices have been rising steadily in recent months. The maximum prices fixed by this Schedule are based on prices prevailing shortly before the outbreak of the war in the Pacific. The Office of Price Administration has determined, after investigation and conference with both the producing and consuming elements of the industry, that price advances beyond the maximum prices set forth herein are not necessary to produce the maximum supply of scrap rubber.

Because of the vital importance to the nation's war effort of keeping the cost of substitution of reclaimed rubber for crude rubber to a minimum, the Office of Price Administration fixed the price of reclaimed rubber by Price Schedule No. 56.[2] As an essential and integral part of the Government's rubber program, and in order to make the other steps effective, it is necessary during the present emergency to establish maximum prices for scrap rubber.

Accordingly, under the authority vested in me by Executive Order No. 8734, it is hereby directed that:

1315.1251 *Maximum Prices for Scrap Rubber.* On and after February 5, 1942, regardless of the terms of any contract of sale or purchase or other commitment, no person shall sell, offer to sell, deliver or transfer scrap rubber to any consumer, and no consumer shall buy, offer to buy, or accept delivery of scrap rubber at prices higher than the maximum prices set forth in Appendix A hereof, incorporated herein as section 1315.1260.*

1315.1252 *Less Than Maximum Prices.* Lower prices than those set forth in Appendix A may be charged, demanded, paid, or offered.*

1315.1253 *Evasion.* The price limitations set forth in this Schedule shall not be evaded by direct or indirect methods in connection with a purchase, sale, delivery, or transfer of scrap rubber, alone or in conjunction with any other material, or by way of any commission, service, transportation, or other charge, or discount, premium or other privilege, or by tying-agreement or other trade understanding, or otherwise.*

1315.1254 *Records and Reports.* Every person making any sale of scrap rubber to a consumer and every consumer making any purchase of scrap rubber after February 5, 1942, shall keep for inspection by the Office of Price Administration, for a period of not less than one year, complete and accurate records of (a) each such purchase or sale showing the date thereof, the name and address of the buyer and the seller, the quantity of each kind or grade purchased or sold, and the price paid or received, showing as a separate item any transportation charges added to the maximum price pursuant to paragraph (e) of Appendix A, and (b) the quantity of each grade of scrap rubber (1) on hand, and (2) on order, as of the close of each calendar month.

Persons affected by this Schedule shall submit such reports to the Office of Price Administration as it may from time to time require.*

1315.1255 *Affirmation of Compliance.* On or before March 10, 1942, and on the 10th day of each month thereafter, every person who, during the preceding calendar month, has sold scrap rubber to a consumer, whether for immediate or future delivery, shall submit to the Office of Price Administration an affirmation of compliance on Form 187:1 containing a sworn statement that during such month all such sales were made at prices in compliance with this Schedule, or with any exception therefrom or modification thereof. Copies of Form 187:1 can be procured at the Office of Price Administration or, provided that no change is made in the style and content of the form and that it is reproduced on 8 by 10½-inch paper, they may be prepared by persons required to submit affirmations of compliance hereunder.*

1315.1256 *Enforcement.* In the event of refusal or failure to abide by the price limitations, record requirements or other provisions of this Schedule, or in the event of any evasion or attempt to evade the price limitations or other provisions of this Schedule, the Office of Price Administration will invoke all appropriate sanctions at its command, including taking action to see (a) that the Congress and the public are fully informed thereof, (b) that the powers of the Government, both State and Federal, are fully exerted in order to protect the public interest and the interests of those persons who comply with this Schedule, (c) that full advantage will be taken of the cooperation of the various political subdivisions of the state, county, and local governments by calling to the attention of the proper authorities failures to comply with this Schedule which may be regarded as grounds for the revocation of licenses and permits; and (d) that the Rubber Reserve Co. and the procurement services of the Government are requested to refrain from selling to or purchasing from those persons who fail to comply with this Schedule.

Persons who have evidence of the offer, receipt, demand, or payment of prices higher than the maximum prices, or any evasion or effort to evade the provisions hereof, or of speculation or manipulation of prices of scrap rubber, or of the hoarding or accumulation of unnecessary inventories thereof, are urged to communicate with the Office of Price Administration.*

1315.1257 *Modification of the Schedule.* Persons complaining of hardship or inequity in the operation of this Schedule may apply to the Office of Price Administration for approval of any modification thereof or exception therefrom: *Provided*, That no applications under this section will be considered unless filed by persons complying with this Schedule.*

1315.1258 *Definitions.* When used in this Schedule the term:

(a) "Person" means an individual, partnership, association, corporation, or other business entity;

(b) "Scrap rubber" means the kinds and grades of scrap rubber listed in Appendix A;

(c) "Consumer" means any person consuming scrap rubber in the manufacture of any product except tire repair materials or accessories. It does not include a person who repairs or reconditions scrap rubber articles to make them re-usable for the purpose for which they were originally manufactured;

(d) "Consuming mill" means a mill or other establishment where a consumer uses scrap rubber;

(e) "Consuming center" means one of the towns, listed in Tables 1 and 2 of Appendix A, in which consuming mills are located;

(f) "Ton" means a short ton of 2,000 pounds net weight determined at the consuming mill. Bags, coverings, or containers shall not be included in the net weight.*

1315.1259 *Effective Date of This Schedule.* This Schedule shall become effective on February 5, 1942.*

1315.1260 Appendix A—*Maximum Prices for Scrap Rubber.*

(a) *Chief Consuming Centers.* The maximum prices listed in Tables 1 and 2 for each consuming center are applicable to every sale of scrap rubber to any consumer for use in a consuming mill located in such consuming center, regardless of the place from which the scrap may have been shipped or where the actual sale may have been made.

(b) *Other Consuming Mills.* For any sale of scrap rubber to any consumer for use in a consuming mill not located in one of the consuming centers listed in Tables 1 and 2, the applicable maximum prices shall be those set forth in Tables 1 and 2 for the one of the consuming centers there listed to which the freight charge on scrap rubber from such consuming mill is lowest. If from any such consuming mill the freight charge on scrap rubber to two or more of the consuming centers listed in Tables 1 and 2 is equal and it is not lower to any of the others, the maximum prices applicable to sales for consumption in such mill shall be the prices set forth in Tables 1 and 2 for the one of those consuming centers with equal freight rates whose maximum prices are lowest.

(c) *Delivered Prices.* The prices specified in this Appendix are the maximum prices that may be paid by any consumer or charged by any person for scrap rubber delivered to a consuming mill. The maximum prices set forth herein shall include all transportation costs except as provided in paragraph (e) below.

(d) *Packing.* The maximum prices specified in this Appendix apply to scrap rubber that is packed as follows: Mixed and beadless passenger and truck tires as listed in Table 1 may be shipped bundled or loose in cars. All other grades of scrap

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[1] Title 32—National Defense Chapter XI—Office of Price Administration, Part 1315—Rubber and Products and Materials of which Rubber is a Component.

[2] 6 F.R. 6455.

*1315.1251 to 1315.1260, inclusive, issued under the authority contained in Executive Orders Nos. 8734, 8875; 6 F.R. 1917, 4483.

rubber shall be packed in bags or bales, with each grade packed separately. Each bale shall weigh not less than 500 pounds, or more than 1,500 pounds and shall be well and securely bound. Any scrap rubber not packed in accordance with the provisions of this paragraph must be sold at appropriate differentials below the maximum prices.

(e) *Freight Allowance for Long Hauls.* For any scrap rubber consisting of mixed or beadless passenger or truck tires as listed in Table 1 on which the actual transportation charges paid for the direct shipment to a consuming mill exceed eight dollars ($8) per ton, the maximum prices specified in this Appendix may be increased by a sum per ton in excess of the difference between $8 and such actual transportation cost involved per ton.

(f) *Premiums for Large Deliveries.*

(1) *Allowance of Premiums.* On any single sale of scrap rubber consisting of grades specified in subparagraph (2) below as belonging to one of the groups therein set forth and amounting to or exceeding the tonnage figure set forth in subparagraph (2) for that particular group, the amounts specified in subparagraph (3) below for each grade may be added to the maximum prices of each such grade, provided delivery to the consuming mill of the full amount of such sale is completed within 60 days after the receipt at such mill of the first delivery on such sale.

The amount of tonnage specified in subparagraph (2) for each group may consist of any combination of grades included in that group. In no case may the minimum tonnage required by subparagraph (2) for any group be figured by including grades listed in that subparagraph as falling within another group.

(2) *Groups Entitled to Premiums. Group A* consists of mixed or beadless passenger or truck tires as listed in Table 1. To be entitled to a premium, a single sale of scrap rubber in this group must consist of 750 tons or more. *Group B* consists of grades listed in Tables 1 and 2 as S. A. G., peelings, or carcass. To be entitled to a premium, a single sale of scrap rubber in this group must consist of 400 tons or more. *Group C* consists of tubes as listed in Table 2. To be entitled to a premium, a single sale of scrap rubber in this group must consist of 150 tons or more.

(3) *Amount of Premiums.* The amounts that may be added to the maximum prices for specific grades of scrap rubber under the provisions of this paragraph (f) are:

(i) One dollar and fifty cents ($1.50) per ton for beadless passenger or truck tires as listed in Table 1;

(ii) One dollar ($1) per ton for any scrap rubber except beadless passenger or truck tires, the maximum price of which, as set forth in Tables 1 and 2, is $20 per ton or less;

(iii) Five per cent (5%) of the maximum price set forth in Tables 1 and 2 or $5.00 per ton, whichever is less for any scrap rubber except beadless passenger or truck tires, the maximum price of which, as set forth in Tables 1 and 2, is over $20 per ton.*

Issued this 31st day of January, 1942.

LEON HENDERSON
Administrator

TABLE 1. MAXIMUM PRICES AT CONSUMING CENTERS

(Dollars per short ton)

Grade	(*)	(†)	(‡)	(§)	(‖)	(¶)	(x)
1/ Passenger tires—							
2/ Mixed passenger tires	$18.00	$17.50	$16.40	$14.00	$12.00	$15.50	$16.50
3/ Beadless passenger tires	24.00	23.50	22.00	19.00	16.50	20.88	22.12
4/ Passenger S. A. G.	18.50	18.00	16.90	14.50	12.50	16.00	17.00
5/ Truck tires—							
6/ Mixed truck tires	18.00	17.50	16.40	14.00	12.00	15.50	16.50
7/ Beadless truck tires	24.00	23.50	22.00	19.00	16.50	20.88	22.12
8/ No. 1 Truck S. A. G.	16.50	16.00	14.90	12.50	10.50	14.00	15.00
9/ No. 2 Truck S. A. G.	16.50	16.00	14.90	12.50	10.50	14.00	15.00

*Akron, O. †Buffalo, N. Y. ‡East St. Louis, Ill. §Gadsden, Ala. ‖Los Angeles, Calif. ¶Memphis, Tenn. xNaugatuck, Conn.

1/ *Passenger Tires.* Shall consist of whole pneumatic tire casings having six plies or less, and shall be free from hard, oxidized, burnt, filled, non-pneumatic, single tube and motorcycle tires, and from leather and metal.

2/ *Mixed Passenger Tires.* This grade shall consist of black whole tires free from stripped tires. White or colored sidewall tires are permissible. A maximum of 10% may consist of roadworn tires.

3/ *Beadless Passenger Tires.* This grade shall consist of Mixed Passenger Tires from which the beads have been cut, but which conform otherwise to the specifications for Mixed Passenger Tires.

4/ *Passenger S. A. G.* This grade shall consist of pieces of pneumatic passenger tires from which the treads and beads have been removed and may or may not contain sidewall rubber.

5/ *Truck Tires.* Shall consist of whole pneumatic casings for busses and trucks having seven plies or more, and shall be free from hard, oxidized, burnt, filled, non-pneumatic single tube tires, and from leather and metal.

6/ *Mixed Truck Tires.* This grade shall consist of black whole tires free from stripped tires. White or colored sidewall tires are permissible. A maximum of 10% may consist of roadworn tires.

7/ *Beadless Truck Tires.* This grade shall consist of Mixed Tires from which the beads have been cut but which conform otherwise to the specifications for Mixed Truck Tires.

8/ *No. 1 Truck S. A. G.* This grade shall consist of pieces of pneumatic bus and truck tires from which the tread and beads, but not the sidewall, have been removed.

9/ *No. 2 Truck S. A. G.* This grade shall consist of a mixture of No. 1 Passenger S. A. G. with No. 1 Truck S. A. G. and may or may not contain sidewall rubber.

TABLE 2. MAXIMUM PRICES AT CONSUMING CENTERS

Grade	Dollars per Short Ton (*)	(†)
1/ No. 1 passenger peelings	$47.50	$40.00
2/ No. 2 passenger peelings	30.00	22.50
3/ No. 3 passenger peelings	27.50	20.00
4/ No. 1 truck peelings	47.50	37.50
5/ No. 1A truck peelings	50.00	38.75
6/ No. 2 truck peelings	30.00	22.50
7/ No. 3 truck peelings	27.50	20.00
8/ No. 1 light colored (zinc) carcass	52.50	40.00
9/ No. 2 light colored carcass	50.00	38.75
10/ Gray carcass	47.50	37.50
11/ Passenger tubes—	(Cents per Pound)	
12/ No. 2 passenger tubes	7¾	7¼
13/ Light colored No. 2 passenger tubes	8¼	7¾
14/ Red passenger tubes	7½	7
15/ Black passenger tubes	6¾	6¼
16/ Mixed passenger tubes	6¾	6¼
17/ Truck tubes—		
18/ No. 2 truck tubes	7½	7
19/ Red truck tubes	7¾	6¾
20/ Black truck tubes	5¼	4¾
21/ Two-toned black-gold tubes	6¾	6¼
22/ Two-toned red-black tubes	6½	6

*Akron, O.; Buffalo, N. Y.; East St. Louis, Ill.; Gadsden, Ala.; Memphis, Tenn.; Naugatuck, Conn. †Los Angeles, Calif.

1/ *No. 1 Passenger Peelings.* This grade shall consist of treads stripped from black pneumatic passenger tires. The material shall be free from fabric, metal, leather, and hard, burnt, or oxidized treads.

2/ *No. 2 Passenger Peelings.* This grade shall consist of treads stripped from black pneumatic passenger tires. The material may contain cushion rubber, breaker fabric and sidewalls plus no more than one full ply of carcass fabric.

3/ *No. 3 Passenger Peelings* (Bald Head Peelings). This grade is the same as No. 2 Passenger Peelings except that a part of the tread has been removed.

4/ *No. 1 Truck Peelings.* This grade shall consist of treads stripped from black pneumatic bus and truck tires. The material may contain cushion rubber, but shall be free from fabric, metal, leather, and hard, burnt, or oxidized treads. This grade may contain not more than 10% of No. 1 Passenger Peelings.

5/ *No. 1A Truck Peelings.* This grade shall have the same specifications as No. 1 Truck Peelings except these peelings shall be free from cushion rubber.

6/ *No. 2 Truck Peelings.* This grade shall consist of treads stripped from black pneumatic bus and truck tires. The material may contain cushion rubber, breaker fabric and sidewalls, but no more than one full ply of carcass fabric.

7/ *No. 3 Truck Peelings* (Bald Head Peelings). This grade is the same as No. 2 Truck Peelings except that a part of the tread has been removed.

8/ *No. 1 Light Colored Carcass.* This grade shall consist of all white zinc carcass free of black edges and any other colored rubber.

9/ *No. 2 Light Colored Carcass.* This grade shall consist of light colors as white, pink, light gray, pure gum, and light brown carcass, free of all black edges and dark colored rubber.

10/ *Gray Carcass.* This grade shall consist of gray, and colors too dark for delivery under No. 2 Light Colored Carcass, and shall be free of all black edges and black rubber.

11/ *Passenger Tubes.* Shall consist of inner tubes for pneumatic passenger tires, free from sections of tubes less than 12 inches long, free from truck, bus, and puncture-proof tubes, crusty and oxidized tubes, and free from metal and punchings. All passenger tubes, except Mixed Passenger Tubes, shall be free from metal valves. All passenger tubes, except Mixed Passenger Tubes and Black Passenger Tubes, shall be free from black rubber valve cots and the bases of such valves.

12/ *No. 2 Passenger Tubes.* This grade shall consist of compounded passenger tubes free from black, red and two-toned passenger tubes.

13/ *Light Colored No. 2 Passenger Tubes.* This grade shall consist of No. 2 Passenger Tubes specially selected as to color by agreement between the buyer and the seller.

14/ *Red Passenger Tubes.* This grade shall be strictly RED tubes.

15/ *Black Passenger Tubes.* This grade shall be strictly black compounded passenger tubes. Black rubber valve cots and their bases may be present, but no metal valves or parts.

16/ *Mixed Passenger Tubes.* This grade shall consist of whole tubes of various colors and qualities and may contain valves unless otherwise specified in the purchase contract.

17/ *Truck Tubes.* Shall consist of inner tubes for pneumatic truck and bus tires, free from sections of tubes less than 12 inches long, and free from crusty, oxidized or puncture-proof tubes, metal, and punchings. All truck tubes, except Mixed Truck Tubes, shall be free from metal valves and from black rubber valve cots and the bases of such valves unless otherwise specified in the purchase contracts.

18/ *No. 2 Truck Tubes.* This grade shall consist of compounded truck tubes free from black, red, and two-toned tubes.

19/ *Red Truck Tubes.* This grade shall be strictly RED tubes.

20/ *Black Truck Tubes.* This grade shall be strictly black compounded truck tubes. Black rubber valve cots and their bases may be present, but no metal valves and parts.

21/ *Two-Toned Black-Gold Tubes.* This grade shall be two-toned black and gold passenger or truck tubes.

22/ *Two-Toned Red-Black Tubes.* This grade shall be two-toned red and black passenger or truck tubes.

Thermax "S"

Thermax "S", recently announced by R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y., is a dustless compounding ingredient for butadiene-type synthetic rubbers. It is a two-purpose material in that it acts both as a filler and as a plasticizer. The outstanding feature of Thermax "S" is said to be the rapidity with which it is taken up by the synthetic rubber, thereby greatly shortening the mixing time of the stock. Its plasticizing effect is noticed immediately, and it reportedly imparts excellent tubing and calendering properties. The plasticizer content of Thermax "S" is about 15%.

Amendments to Supplementary Order No. M-15-C, to Restrict Transactions in New Rubber Tires, Casings, and Tubes[1]

No. 3

(a) Paragraph (g) of Section 940.4 is hereby amended to read as follows:

(g) *Exemption of Certain Transactions.* Nothing in this Order shall prevent any person from making (without a certificate or other authority of the Office of Price Administration, but subject to the provisions of Priorities Regulation No. 1 and any other applicable rules, regulations or orders of the Director of Priorities heretofore or hereafter issued) a sale, lease, trade, loan, delivery, shipment or transfer of new rubber tires, casings or tubes:

(1) To or for the account of the Army or Navy of the United States, the United States Maritime Commission, the Panama Canal, the Coast and Geodetic Survey, the Coast Guard, the Civil Aeronautics Authority, the National Advisory Commission for Aeronautics, or the Office of Scientific Research and Development; but not to or for the account of any officer, member or employe of any of the foregoing for use on a privately owned vehicle, regardless of the extent to which such vehicle is used on official business, nor to or for the account of any post exchange, ship's store, commissary or similar agency or organization except for use on vehicles operated by it.

(2) To or for the account of the government of any foreign country, including those in the Western Hemisphere, pursuant to a contract or order placed by any agency of the United States Government under the Act of March 11, 1941, entitled "An Act to Promote the Defense of the United States" (Lend-Lease Act), but subject in each case to such quotas, allocations or other restrictions as may be prescribed by the Office of Production Management.

(3) For export to any foreign country, for government or private account otherwise than as provided in (2) above, but only as may be expressly permitted by the Office of Production Management.

Any person, government or governmental agency acquiring a new rubber tire, casing or tube, under this paragraph (g) shall execute and deliver to the person from whom such tire, casing, or tube was acquired a receipt evidencing the transaction, the receipt to be in such form as the Office of Price Administration may direct.

No preference rating heretofore or hereafter assigned by any PD-3 certificate or by any other preference rating certificate or by any order of the Director of Priorities shall entitle any person to receive any new rubber tires, casing, or tube except in a transaction specified in subparagraph (1), (2) or (3) above. Persons to whom such ratings have been issued and who wish to acquire such tires, casings, or tubes for vehicles included in the categories enumerated in List A may apply therefore as provided in paragraph (e) hereof.

(b) This amendment shall take effect immediately.

(PD. Reg. 1 Amended, Dec. 23, 1941, 6 F.R. 6680; O.P.M. Reg. 3 Amended, Sept. 2 1941, 6 F.R. 4865; E.O. 8629, Jan. 7, 1941, 6 F.R. 191; E.O. 8875, Aug. 28, 1941, 6 F.R. 4483; sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Sessions; sec. 9, Public No. 783, 76th Congress, Third Session.)

Issued this 20th day of January, 1942.

DONALD M. NELSON
Director of Priorities

No. 4

Sections 940.4 (c) (2), 940.4 (e) and 940.4 (f) are hereby amended to read as follows and Section 940.4 (c) (3) is hereby revoked.

940.4. *Supplementary Order M-15-c.*

(c) *Prohibition on Deliveries of New Rubber Tires, Casings, and Tubes except to Persons Possessing Certificates.*

(2) Except as provided in subparagraph (4) of this paragraph (c), a person selling new rubber tires, casings, or tubes at a retail store, outlet, or premises, which for purposes of this Order shall mean a store, outlet or premises from which transfers or deliveries are made predominantly direct to consumers, may sell, lease, trade, lend, deliver, ship, or transfer any new rubber tire, casing, or tube from such premises to a person possessing a certificate authorizing such purchase issued by the Office of Price Administration.

(e) *Acquisition of New Rubber Tires, Casings, Tubes by Persons in the Categories Enumerated in List A Attached hereto.* Any person who believes that the vehicle for which he wishes to acquire new rubber tires, casings, or tubes is included in one of the categories enumerated in List A attached hereto may apply to the Office of Price Administration for a certificate permitting him to purchase, lease, trade, borrow, or accept delivery, shipment or transfer of new rubber tires, casings, or tubes. Such permission may be granted by the Office of Price Administration upon a showing by the applicant of the following facts:

(1) That the vehicle on which the new rubber tire, casing, or tube is to be mounted is included in one of the categories enumerated in List A, and thus constitutes an "eligible" vehicle.

(2) That the vehicle on which the new rubber tire, casing, or tube is to be mounted cannot be replaced by a vehicle owned or operated by or subject to the control of the applicant, which is equipped with serviceable tires and tubes and which is not fully employed for a use specified in one or more of the categories enumerated in List A.

(3) That the new rubber tire, casing, or tube is to be installed at once on a wheel or trim, to replace a tire, casing, or tube no longer serviceable.

(4) That the tire, casing, or tube, when added to all other tire, casings, and tubes in the applicant's possession whether unmounted or mounted on a vehicle, and when that total is applied only to eligible vehicles, does not add up to more than one spare tire, casing, or tube of a given size for each eligible vehicle.

(5) That the existing tire, casing, or tube cannot be recapped, retreaded or repaired for safe use at speeds at which the applicant may reasonably be expected to operate, or that such recapping, retreading, or repairing cannot be obtained without inordinate delay.

(6) That the applicant agrees to trade in replaced tires, casings, and tubes on new tires, casings, and tubes purchased under this Order, or to dispose of replaced tires, casings, and tubes as may otherwise be directed by the Office of Price Administration.

(7) That, if the applicant desires authority to purchase a passenger car type new tire of over four-ply construction, the vehicle upon which the new tire is to be mounted cannot be satisfactorily operated in the use to which it is to be put with a tire of four-ply construction.

Upon being satisfied that all of these facts exist, the Office of Price Administration may issue to the applicant a certificate stating the number, size, construction, and type of new rubber tires, casings, and tubes which the applicant is authorized to acquire. Such certificate shall be recognized by any person having new rubber tires, casings, or tubes for sale, and no sale, lease, trade, loan, delivery, shipment, or transfer of new rubber tires, casings, or tubes (except as provided in paragraphs (c), (g), and (h) hereof) shall be made except on the basis of such certificate.

(f) *Acquisition of "Obsolete" Type New Rubber Tires, Cas-*

[1] Title 32—National Defense Chapter IX—Office of Production Management, Subchapter B—Priorities Division. Part 940—Rubber and Products and Materials of Which Rubber Is a Component.

ings, and Tubes. Any person wishing to acquire "obsolete" type new rubber tires, casings, or tubes may apply to the Office of Price Administration for permission to purchase, lease, trade, borrow, or accept delivery, shipment, or transfer of such "obsolete" type new rubber tires, casings, or tubes. Such permission may be granted by the Office of Price Administration upon a showing by the applicant of items (3) and (6) of paragraph (e) hereof. Upon being satisfied that all of the facts required by items (3) and (6) exist, the Office of Price Administration may issue to the applicant a certificate stating the number and types of "obsolete" type new rubber tires, casings, and tubes which the applicant is authorized to acquire. Such certificate shall be recognized by any person having "obsolete" type new rubber tires, casings, or tubes for sale, and no sale, lease, trade, loan, delivery, shipment, or transfer of "obsolete" type new rubber tires, casings, or tubes (except as provided in paragraphs (c), (g), and (h) hereof) shall be made except on the basis of such a certificate.

As here used the word "obsolete" refers to passenger car type tires, casings, and tubes of the following sizes, and no others:

525-19	525-20	650-21
525-550-19	550-20	700-21
550-19	600-20	500-22
600-19	600-650-20	600-22
600-650-19	650-20	750-14
650-19	440-450-21	30x3
700-19	440-21	30x3½
750-19	450-21	31x4
450-20	475-21	32x4
475-20	500-21	33x4
450-475-500-20	525-21	32x4½
500-20	600-21	33x4½
		34x4½

This amendment No. 4 shall become effective January 16, 1942. Issued this 15th day of January, 1942.

LEON HENDERSON
Administrator

No. 5

Section 940.4 (b) is amended by adding thereto subparagraphs (5), (6), (7), (8), (9) and (10), and Sections 940-4 (c) and 940.4 (e) (4) are amended to read as follows:

940.4. *Supplementary Order M-15-c.*

(b) *Definitions.*

(5) "Consumer" means any person who operates vehicles using tires.

(6) "Retailer" means a person selling new rubber tires, casings, or tubes exclusively to consumers, including commercial accounts.

(7) "Wholesaler" means a person selling new rubber tires, casings, or tubes exclusively to persons buying for purposes of resale and to commercial accounts.

(8) "Distributer" means a person selling new rubber tires, casings, or tubes both to consumers, including commercial accounts, and to persons who buy for purposes of resale.

(9) "Manufacturer" means a person who manufactures new rubber tires, casings, or tubes.

(10) "Commercial Accounts" means a person who operates five or more vehicles using tires.

(c) *Prohibition of Deliveries of New Rubber Tires, Casings, and Tubes, Except to Persons Possessing Certificates.*

(1) Except as provided in this paragraph and in paragraphs (g) and (h) hereof, or in regulations hereafter issued by the Office of Price Administration, no person shall sell, lease, trade, lend, deliver, ship, or transfer new rubber tires, casings, or tubes, and no person shall accept any such sale, lease, trade, loan, delivery, shipment, or transfer of any such new rubber tires, casings, or tubes. (The provisions of this paragraph shall apply to all new rubber tires, casings, and tubes, whether such new rubber tires, casings, and tubes are at the date of issuance of this Order already manufactured, or whether such new rubber tires, casings, and tubes are manufactured in the future).

(2) No retailer, distributer, wholesaler or manufacturer possessing new rubber tires, casings, or tubes, or otherwise acquiring such tires, casings, or tubes shall mount such tires, casings, or tubes on vehicles owned by him or otherwise subject to his control unless he holds a certificate issued by the Office of Price Administration; provided that a manufacturer may mount new tires, casings, or tubes on a vehicle owned by him or otherwise subject to his control used exclusively for testing purposes and not in connection with any other use.

(3) Any person, except a retailer, distributer, wholesaler, or manufacturer may sell, lease, trade, lend, deliver, ship, or transfer new rubber tires, casings, or tubes to a retailer, distributer, wholesaler, or manufacturer.

(4) A retailer may sell, lease, trade, lend, deliver, ship, or transfer any new rubber tire, casing, or tube (i) to any consumer in exchange for a certificate authorizing such purchase issued by the Office of Price Administration; (ii) to any other retailer; (iii) to any distributer; (iv) to any wholesaler; or (v) to any manufacturer.

Any retailer making a sale, lease, trade, loan, delivery, shipment, or transfer pursuant to subdivisions (ii), (iii), (iv), and (v) of this subparagraph (4) shall keep records showing the name of the person acquiring the new rubber tires, casings, or tubes, the number and type of tires, casings, or tubes acquired, the sales price, and the date of the transfer.

(5) Any distributer may sell, lease, trade, lend, deliver, ship, or transfer any new rubber tire, casing, or tube (i) to any consumer in exchange for a certificate authorizing such purchase issued by the Office of Price Administration; (ii) to any retailer or distributer, but only in exchange for the appropriate part of the certificate issued pursuant to paragraph (e) of this Order or the receipt issued pursuant to paragraph (g) of this Order; (iii) to any wholesaler; or (iv) to any manufacturer.

Any distributer making a sale, lease, trade, loan, delivery, shipment, or transfer pursuant to subdivisions (ii), (iii), and (iv) of this subparagraph (5) shall keep records showing the name of the person acquiring the new rubber tires, casings, or tubes, the number and type of tires, casings, or tubes acquired, the sales price, and the date of the transfer.

(6) Any wholesaler may sell, lease, trade, lend, deliver, ship, or transfer any new rubber tire, casing, or tube (i) to a consumer in exchange for a certificate authorizing such purchase issued by the Office of Price Administration provided that such consumer purchased or leased new rubber tires, casings, or tubes direct from such wholesaler's warehouse during the calendar year 1941; (ii) to any retailer, distributer, or wholesaler, but only in exchange for the appropriate part of the certificate issued pursuant to paragraph (e) of this Order or the receipt issued pursuant to paragraph (g) of this Order; or (iii) to any manufacturer.

Any wholesaler making a sale, lease, trade, loan, delivery, shipment, or transfer pursuant to subdivisions (ii) and (iii) of this subparagraph (6) shall keep records showing the name of the person acquiring the new rubber tires, casings, or tubes, the number and type of tires, casings, or tubes acquired, the sales price, and the date of the transfer.

(7) Any manufacturer may sell, lease, trade, lend, deliver, ship, or transfer any new rubber tires, casings, or tubes (i) to a consumer in exchange for a certificate authorizing such purchase issued by the Office of Price Administration, provided that such consumer purchased or leased new rubber tires, casings, or tubes direct from such manufacturer's factory or warehouse during the calendar year 1941; or (ii) to any retailer, distributer, wholesaler, or manufacturer, but only in exchange for the appropriate part of the certificate issued pursuant to paragraph (e) of this Order or the receipt issued pursuant to paragraph (g) of this Order; provided that during each quarter of every calendar year commencing January 1, 1942, no manufacturer shall sell, lease, trade, lend, deliver, ship, or transfer to retailers and distributers owned, operated, or controlled by such manufacturer a wholesale dollar value of new rubber tires and tubes in excess of the ratio which the wholesale dollar value of new rubber tires and tubes sold, leased, traded, loaned, delivered, or transferred to all retailers or distributers owned, operated, or controlled by such manufacturer bore to its total wholesale dollar value of new rubber tires and tubes sold, leased, traded, loaned, delivered, shipped, or transferred for each quarter in 1941.

Any manufacturer making a sale, lease, trade, loan, delivery, shipment or transfer, pursuant to

subdivision (ii) of this subparagraph (7) shall keep records showing the name of the person acquiring the new rubber tires, casings, or tubes, the number and type of tires, casings, or tubes acquired, the sales price, and the date of the transfer.

(8) Any retailer or distributer may deliver, ship, or transfer new rubber tires, casings, or tubes to any warehouse or premise owned, operated, or controlled by such person, provided there is no change in ownership or control involved in this delivery, shipment, or transfer. Records of such delivery, shipment, or transfer shall be kept and reports in connection therewith shall be made as may be required by the Office of Price Administration.

(9) Any wholesaler or manufacturer may deliver, ship, or transfer new rubber tires, casings, or tubes to any warehouse or premise owned, operated or controlled by such person and not used in performing the functions of a distributer or retailer provided there is no change in ownership or control involved in this delivery, shipment, or transfer. Records of such delivery, shipment, or transfer shall be kept and reports in connection therewith shall be made as may be required by the Office of Price Administration.

(10) Any common carrier which on December 11, 1941, was in possession of shipments of new rubber tires, casings, and tubes consigned to a consignee may (without certificates) deliver such tires, casings, and tubes to such consignee.

(11) Any manufacturer may sell, transfer, or deliver, with the written approval of the Director of Priorities of the Office of Production Management, any new rubber tire, casing, or tube to a manufacturer of new vehicles to be used as part of the original equipment of such vehicles. Records of such transfers shall be kept and reports in connection therewith shall be made as may from time to time be quired by the Office of Production Management.

(e) *Acquisition of New Rubber Tires, Casings, and Tubes by Persons in the Categories Enumerated in List A Attached hereto.*

(4) That the tire, casing, or tube for which application is made when added to all other tires, casings, or tubes of whatever condition in the applicant's possession whether unmounted or mounted on a vehicle, will not add up to more than one spare tire of a given size for each eligible vehicle; provided, however, that when the applicant is a retailer, distributer, wholesaler, or manufacturer of new rubber tires, casings, or tubes this section (4) of paragraph (e) can be satisfied by showing that the applicant operates only eligible vehicles and that none of his vehicles is equipped with more than one spare tire and tube of a given size.

(6 F.R. 6792)

This amendment No. 5 shall become effective January 28th, 1942.

Issued this 21st day of January, 1942.

LEON HENDERSON
Administrator

No. 6

Section 940.4 (c) is hereby amended by adding thereto the following subparagraph (12):

940.4. *Supplementary Order M-15-c.*

(c) *Prohibition on Deliveries of New Rubber Tires, Casings, and Tubes except to Persons Possessing Certificates.*

(12) Anything in this paragraph (c) to the contrary notwithstanding, the Office of Price Administration may issue to any person owning, operating or controlling a recapping or retreading mold a certificate specified in paragraph (e) hereof subject to such restrictions as may be prescribed by the Office of Price Administration.

(6 F.R. 6792)

This Amendment No. 6 shall become effective February 13, 1942.

Issued this 9th day of February, 1942.

LEON HENDERSON
Administrator

No. 7

Section 940.4 (c) (2) is amended to read as follows:

940.4 *Supplementary Order M-15-c.*

(c) *Prohibition on Deliveries of New Rubber Tires, Casings, and Tubes except to Persons Possessing Certificates.*

(2) The prohibitions set forth in subparagraph (1) of this paragraph (c) which include prohibitions against both transfer of any legal or equitable right or interest in or to, or physical transfer of, any new rubber tire, casing, or tube including the placing of such tire, casing, or tube upon a wheel or rim shall not apply in the following cases:

(i) Any person who on December 11, 1941, was not a retailer, distributer, wholesaler, or manufacturer, may transfer any new rubber tire, casing, or tube which was owned and physically possessed by him prior to December 11, 1941, including the placing of such tire, casing, or tube upon the wheel or rim of any vehicle owned or operated by him, provided no change in ownership, possession, or control occurs.

(ii) Any person may deliver, ship, or transfer new tires or tubes to a public warehouse for storage, provided there is no change in ownership, use, or control involved in this delivery, shipment, or transfer. Any person operating a public warehouse may deliver any new tire, casing, or tube stored in such public warehouse after December 11, 1941, to the person who delivered such tire or tube for storage provided no such delivery may be made without first obtaining authorization for such delivery from the Office of Price Administration, Washington, D. C.

But such prohibitions shall apply to prevent any person who on December 11, 1941, or at any time thereafter was a retailer, distributer, wholesaler, or manufacturer, for mounting any new rubber tire, casing, or tube upon any vehicle owned by him or otherwise subject to his control unless he holds a certificate issued by the Office of Price Administration, except a manufacturer may mount new tires, casings, or tubes on a vehicle owned by him or otherwise subject to his control and used exclusively for testing purposes and not in connection with any other use. No provision of this paragraph (c) shall impose any liability upon any common carrier for the transportation in the regular course of its business of any new rubber tire, casing, or tube not owned by such common carrier and shall not excuse any common carrier from its obligation to accept any goods for transportation.

(6 F.R. 6792)

This Amendment No. 7 shall become effective February 16, 1942.

Issued February 16, 1942.

LEON HENDERSON
Administrator

Rubber Manufacturing Illumination

The illumination table listed below for rubber tire and tube and mechanical goods manufacturing is the result of recent findings and observations by the Westinghouse Lamp Division, Bloomfield, N. J. It is based on the scientific fact that existing foot-candle levels should be at least doubled if measurable and significant improvements in sending are to result. The new recommendations, moreover, give full weight to the improvements in old light sources, the high efficiencies of the new, and the ever downward trend of lighting costs as a result of all these improvements. The values shown should be provided on the work regardless of whether in a horizontal, vertical, or oblique plane.

Activity	Foot Candles
Rubber Tire and Tube Manufacturing:	
Stock Preparation—	
Plasticating, milling, and Banbury	20
Calendering	30
Fabric Preparation—	
Stock curing and bead building	30
Tube and tread tubing machines	20
Tire Building—	
Solid tires	20
Pneumatic tires	50
Curing Department—	
Tube and casing	50
Final Inspection—	
Tube	50
Casing	100
Wrapping	20
Warehouse	5
Rubber- Goods—Mechanical:	
Stock Preparation—	
Plasticating, milling, and Banbury	20
Calendering	30
Fabric Preparation—	
Stock cutting and hose looms	30
Extruded products	30
Molded products and curing	50
Inspection	100
Boxing	20
Warehouse	5

EDITORIALS

Much in Little

IN LESS than three months of warfare Japan has gained control of one-half the world's rubber production capacity. The situation in the Far East does not look bright. Dutch Borneo and Sumatra may soon fall, and then 83% of rubber production would be in the hands of the Japs. This figure would jump to 90% with the loss of Java. Against this growing disaster sharp measures have been taken in this country. Crude rubber is being strictly rationed; a giant synthetic rubber industry has been announced; and guayule legislation is scheduled for quick passage. All of these measures are justified in the interest of our nation's welfare—the lives of Americans may depend on them.

We may regain this Far Eastern territory within two years' time, but we cannot afford to gamble on this possibility. New sources of rubber must be assured. As we have stated before, we must not neglect *any* possibility in working toward this goal. Synthetic rubber that can be made in our own factories and guayule that can be grown on our own soil are logical future sources of supply. But we should be realistic in our consideration of these potentialities. Our synthetic rubber industry today is for the most part represented by blueprints. Our guayule production of the future is largely represented by 23,000 pounds of seed out in California, not yet planted.

In January, in addition to the above programs, we urged that the wild rubber of South America be exploited as quickly as possible. This measure was advocated with a full realization of the difficulties involved in such a program and of the limitations in respect to the amount of rubber that could be obtained. But the important thing to remember is that the rubber is there *now* and that this rubber is the same rubber as we have been using on a large scale for over 100 years.

How much rubber is there in South America, and how much of this rubber can be gotten out? Frankly we do not know, and we doubt if anyone else knows exactly. Estimates on future production possibilities have varied between 30,000 to 100,000 tons a year. Maximum production for the Americas was 55,000 tons (excluding guayule) back in 1912, including 42,000 tons from the Amazon Valley. For present purposes let us take the figure of 50,000 tons a year, which Jesse Jones recently estimated to be the maximum amount that could be expected from South America for some years.

On first thought 50,000 tons does not appear to be a large quantity of rubber, even in terms of our huge peacetime consumption. But this is war—a war of blood and sweat, rubber, and tin—so today 50,000 tons of rubber is a sizable amount; in two years it might be indispensable. In fact with 50,000 tons of *Hevea* rubber we could produce 10,000,000 first-line 6.00 by 16 tires. Or we could recap over 20,000,000 tires with high-quality camelback. Less rubber in the compound would mean a corresponding increase in the number of units possible to produce or recap. In view of these facts *are* 50,000 *tons of rubber too little to bother with?*

Synthetic rubber in the tire field is relatively untried in this country, and years of actual road tests are required before performance can be proved. It is generally conceded, however, that to obtain satisfactory ply adhesion the carcass should contain natural rubber. Until this problem and other problems in connection with synthetic rubber usage that will undoubtedly arise are solved, a small quantity of *Hevea* rubber may be extremely useful.

Getting the rubber out of South America has its problems too—lack of accessibility, transportation difficulties, and shortages of labor. Much capital will be needed. But all of the programs proposed are beset with difficulties.

The general attitude in this country has been that South America's wild rubber was worth little consideration; that it is only a drop in the bucket, even though the war has made the bucket much smaller. Not until Brazil's Finance Minister, Arthur De Souza Costa, came to Washington did there appear to be much hope of getting a large-scale South American program under way. But as this is being written, it is gratifying to learn that a Brazilian-United States rubber corporation, designed to provide this nation with a dependable natural rubber source of supply, was reported to be under consideration. Not only will we get rubber from such a program, but we will create a large measure of good will with our neighbor to the south. And we need both!

"Wildcat" Rubber Schemes

THREATENED stoppage of our normal rubber supplies has resulted in a sharp increase in the number of proposals designed to meet the rubber needs of the nation. Many rubber-bearing plants are being proposed as a source of supply. New processes for synthesizing and reclaiming rubber are now coming to light. Unfortunately a large proportion of these proposals are "wildcat" schemes, not founded on sound scientific principles and having no possibility of filling our rubber requirements. The National Bureau of Standards, in warning of this situation, outlines a five-step procedure that should be followed by a potential investor, sponsor, or other party interested in finding out the commercial possibilities of a new rubber process (see page 596). If these five specific steps are followed, both "wildcat" schemes and deliberate swindles can be avoided.

At this time the United States Government is becoming the largest single investor in rubber production processes. Huge sums of the taxpayers' money are being spent for this purpose. In spending this money, the government has available the services of the Bureau of Standards to aid in selecting tried and proven processes for growing and synthesizing rubber. The nation is indeed fortunate in having the Rubber Section of the Bureau staffed at this time with men of such outstanding technical ability.

In many instances the use of more MICRONEX makes better products with reclaimed rubber.

MICRONEX

Beads or Compressed

200 TONS OF SMOKE A DAY

A COLUMBIAN COLLOID

COLUMBIAN CARBON COMPANY

BINNEY & SMITH CO. • COLUMBIAN CARBON CO.

DISTRIBUTOR MANUFACTURER

(PLEASE TURN THE PAGE)

RECLAIM RUBBER

THE logical approach to formulation of reclaimed rubber starts with consideration of the make-up of the regenerated stock. Hydrocarbon content may be regarded as rubber available for compounding, and carbon, as already present carbon black. When reinforcement is required this provides sound basis for a systematic study of the effect of further loading.

Actually new Micronex is needed for further reinforcement. Even with tire peeling reclaim fresh addition of Micronex exerts its revitalizing effect. Where reclaim is used as an extender in tread compounds maximum wear is attained only when this as well as the new rubber component, is fully reinforced.

Design is as important to tire performance as is compounding. Just as design has been accommodated to full reinforcement of new rubber, so we venture to assert, improved design will make possible hitherto undreamed of performance with synthetic and reclaimed rubber stocks.

•

BINNEY & SMITH CO. • COLUMBIAN CARBON CO.

DISTRIBUTOR MANUFACTURER

What the Rubber Chemists Are Doing

Rubber Division, A. C. S., Activities

Memphis Meeting Canceled

THE Spring Meeting of the Division of Rubber Chemistry, A. C. S., has been canceled. The meeting was to have been held in Memphis, Tenn., in conjunction with the meeting of the parent society, April 20 to 24. The Division will now concentrate its efforts on the Fall Meeting, to be held in Buffalo, N. Y., in September. At this meeting it is expected that symposia will be held that will deal with questions of vital importance to the industry.

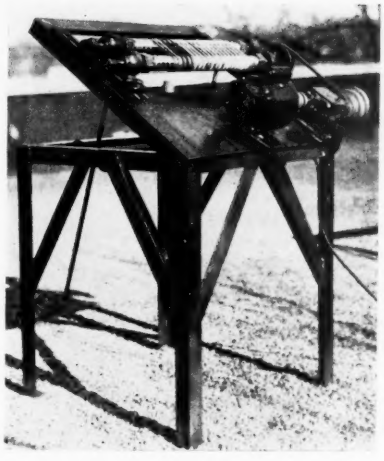
Chicago Group Hears Somerville on Sunlight Aging

A. A. SOMERVILLE, vice president of R. T. Vanderbilt Co., presented a comprehensive discussion on "Weather Aging" at a meeting of the Chicago Group, Rubber Division, A. C. S., held February 5, at the Congress Hotel, Chicago, Ill.

Dr. Somerville's talk was essentially a continuation of a paper on the same subject presented before the American Chemical Society at Atlantic City, N. J., in 1929, but supplemented that paper in bringing the subject matter up-to-date. In testing, 15 different rubber compounds were subjected to sunlight deterioration, with the samples under stress at various elongations (5 to 50%). The samples, 10-inch loops, were stressed between wooden pegs, spaced at different distances on the test board. Five sets of 19 boards were used, with the sets at different locations. One set of samples, which was exposed in the midst of a group of high tension lines, behaved no differently from the others, apparently because the installation was engineered well enough to minimize the formation of free ozone. In general the results confirmed previous observations, showing that maximum deterioration in sunlight took place at 10% elongation.

Dr. Somerville also discussed other test methods. A stepped cone, which was utilized in earlier work, accommodates rubber bands for exposure at various elongations. In another test triangular samples were stressed and then fastened along the base and at the apex which results in less stress at the base than at the apex. A new test machine (illustrated) utilizes Hoover vacuum cleaner rings stressed at 10% elongation around rotating sheaves. This machine, besides providing uniform exposure for the samples, brings in another factor of deterioration: namely, the effect of flexing.

The program was completed by the showing of the sound motion picture, "Eyes of the Navy", by Ensign Gillerlain of the U. S. Navy. The film described in detail the training program for a Navy flying cadet.



Vanderbilt Weather Aging Machine

Calvin Yoran, vice chairman of the group, was in charge of the meeting which attracted more than 150 members and guests. The next Group meeting will be held May 2 at the Congress Hotel.

Du Pont Sponsors Meeting of Los Angeles Group

THE seventy-fifth meeting of the Los Angeles Group, Rubber Division, A. C. S., held February 3 at the Mayfair Hotel, Los Angeles, Calif., was attended by 143 members and guests. The meeting was sponsored by E. I. du Pont de Nemours & Co., Inc., and the table favors were house numbers of Lucite. 1942 Group Yearbooks were presented to the members. Three charter members; P. W. Drew (Goodyear Tire & Rubber Co.); Arthur Wolf (New Jersey Zinc Co.); and E. S. Long (Golden State Rubber Mills) were presented by Chairman G. K. Norton, who also introduced about 30 guests and 10 new members.

H. J. Jordan, du Pont representative, acted as master of ceremonies and discussed the available supply of neoprene compared to crude rubber. He presented a film which showed the development and manufacture of neoprene, and a second in technicolor titled "Better Living through Chemistry" which pictured certain neoprene products and the manufacture of rayon and nylon. A newsreel of the current war was shown through the courtesy of E. L. Royal, of the H. M. Royal Co.

The door prize, a $25 defense bond donated by the Group, was won by M. L. Paine (Firestone Tire & Rubber Co.). Special prizes were a fortnighter case donated by the Charles T. Wilson Co. and won by J. R. Gardner (Gardner Co.), and a lawn sprinkler donated by A. Schrader's Son and won by L. F. McDonald. The second door prize, a tire donated by C. J. Roese (Goodyear) won by K. W. Faulhaber (Faulhaber Rubber Co.) was revealed to be a debeaded scrap tire when Mr. Faulhaber had succeeded, with much effort and some embarrassment, in unwrapping the cellophane and tire wrap that masked the prize.

Akron Group Sees Ohio Films

THE winter meeting of the Akron Group, Rubber Division, A. C. S., was held January 30 at the Akron City Club, Akron, O. A series of Standard Oil Co. films entitled "Let's Explore Ohio" was shown, and music was furnished by "The Rhythm Maids."

"Lamps in the Spectrum" or "Application of Radiation from Filament and Gaseous Discharge Sources", program of the General Electric Co., will be presented at the spring meeting March 20 at the Akron City Club.

New York Group Meets March 20

THE New York Group, Rubber Division, A. C. S., will meet March 20 at 4.30 p.m. in the clubrooms of the Building Trades Employers' Association, 2 Park Ave., New York, N. Y. Prof. H. Mark, of the Brooklyn Polytechnic Institute, will present a paper on "The Fundamental Aspects of the Synthetic Rubber Program"; and P. M. Elliott, of the Naugatuck Chemical Division of the United States Rubber Co., will speak on "Reclaimed Rubber." After dinner two United States Navy films, "American Sea Power" and "Eyes of the Navy", will be shown. Tickets are $2 and are available from Peter P. Pinto, Secretary-Treasurer, 250 W. 57th St., New York, N. Y.

Quebec Group Affiliates with S. C. I.

THE Quebec Rubber and Plastics Group met on February 6 in the Chemistry Building, McGill University, Montreal, P. Q., Canada. The group unanimously voted for immediate affiliation with the Montreal Section of the Society of Chemical Industry.

A sound film illustrating the theory and manufacture of carbon black as a rubber reenforcing agent opened the program. C. R. Haynes, Technical Service Dept., Binney & Smith Co., addressed the Group on the "Manufacture

(*Continued on page 622*)

New Machines and Appliances

Saw-Tooth Laboratory Knife

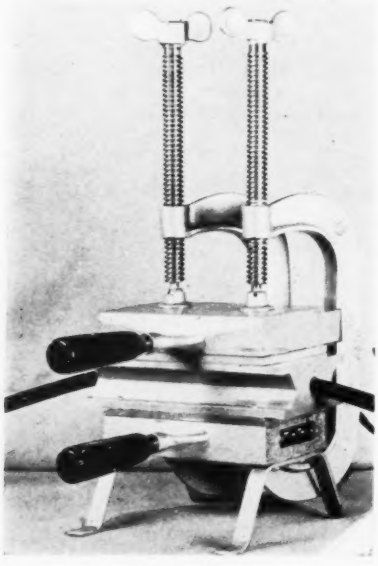
Laboratory Rubber Knife

A THREE-INCH saw-tooth double-edged blade of high tempered steel set in a four-inch metal-ferruled wooden handle provides an effective laboratory knife. The cutting edge, it is claimed, will not rust or corrode under usual conditions. The knife is said to be useful for cutting rubber tubing, stoppers, corks, etc., and soft glass, pyrex, and glass tubing. Chemical Rubber Co.

Shaler Vulcanizer for Cable and Belt Splices

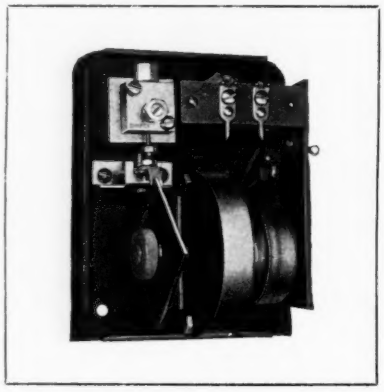
THIS cable and belt splice vulcanizer consists of two heating plates and a set of aluminum mold blocks. A built-in thermostat assures a constant temperature of 280° F., which is taken as the average vulcanizing heat. The blocks will accommodate a variety of cable shapes in sizes from ¼-inch to 2¼ inches outside diameter. For splicing of rubberized fabric belts mold blocks are available in sizes up to four inches wide and 11 inches long.

To vulcanize conductor cable the broken ends of the stripped wire are joined and the old rubber insulation buffed for about two inches at each end beyond the bare wire. The wire and buffed covering are then wound with repair gum, and the completed mold is clamped between the heating plates for 10 minutes.



Cable and Belt Splice Vulcanizer

For belt splices the ends are beveled and the edges roughened and coated with vulcanizing cement. After thorough drying, a piece of 0.030-inch gage repair gum is inserted between the edges and the spliced belt placed in the vulcanizer. Except where V-belts are used on unusually small diameter pulleys, belt splices made on this vulcanizer are claimed to be satisfactory. The Shaler Co.



Blow-Down Cycle Timer

Repeating Cycle Timer

THE Taylor Repeating Cycle Timer, also known as the "Blow-Down Timer", has been developed to handle the periodic purging of condensate from certain types of curing and molding equipment to create adequate heat distribution. The new unit is used in conjunction with a diaphragm motor-operated reverse acting condensate valve, and with suitable temperature or pressure control on the application, permits the admission of fresh steam without affecting an appreciable pressure change within the apparatus. The new instrument permits the control of the duration as well as the period of the blow-down cycle. Taylor Instrument Cos., Rochester, N. Y.

Electric Tachometer Measures Speed of Process Machinery

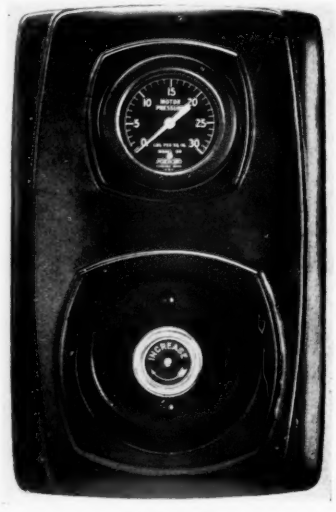
THE essential parts of the G-E tachometer for measuring the speed of cloth finishing and other processes are a single-phase, permanent magnet type generator, rectifier-type indicator, and an adjusting rheostat. The generator has a linear speed voltage curve of approximately 500 to 3,500 r.p.m., and the instrument will cover speeds within a 7 to 1 range. If an indication of r.p.m. is desired, the generator is direct-connected, geared, or belted to the driving shaft with a speed ratio such that the maximum speed of the shaft is equivalent to a generator speed of 3,000 r.p.m.

G-E Tachometer

The calibration of the instrument adjusts for this ratio, and the reading is direct. For indications of linear speed of cloth in yards per minute the calibration of the instrument is made in terms of surface speed of the roll rather than in revolutions. The indicator has a single uniform scale and can be calibrated with such designations as r.p.m., f.p.m., and others to suit special requirements. The instrument, it is claimed, gives accurate speed readings for both directions of rotation, making the use of extra switches for reversing service unnecessary. General Electric Co.

Manual Control Unit for Remote Valves

THIS unit for the manual control of remote valves, dampers, and other pneumatically operated equipment was designed for dead-end service. It will dependably hold reduced pressures to valves within very narrow limits, it is claimed. The unit may also be used for the setting of control points of distant instruments or the adjustment of positioning or pressure-producing pistons, located at inaccessible points. It is said to be practical for operation over distances up to 1,000 feet. When flush-mounted, the front surface of the unit is only $\frac{7}{16}$-inch from the surface of the instrument panel. There are no protruding parts. The Foxboro Co.



Remote Valve Control Unit

UNITED STATES

Specifications Released for Rubber Products; Retreaded Tires Rationed; Scrap Ceilings Set

In a further effort to conserve rubber the War Production Board on February 11, in Supplementary Order No. M-15-b-1 to Restrict the use of Rubber (see pages 578-580), outlined specifications on the amount of crude rubber to be used for each product in ten classes allowed to be manufactured.

An order, originally effective February 19, but postponed in part until February 23, strictly rations retreaded and recapped tires and tubes. (See pages 581-582.)

Additional amendments (see page 585) were also put out for Supplementary Order No. M-15-c on new tire and tube rationing.

Amendment No. 4 to Supplementary Order No. M-15-b (See page 582) redefines "rubber" subject to restriction to allow unrestricted use of unvulcanized scrap rubber (including scraps and trimmings).

Price Schedule No. 87 was issued January 31 setting ceilings on 31 grades of tire and tube scrap. (See pages 583-584, 616.)

President Roosevelt on February 17 vetoed the guayule bill on the grounds that it was confined to the United States and not the Western Hemisphere. Prompt passage of a revised bill was recommended. (See page 598.)

A survey to determine the wild rubber potentialities of Latin America got under way recently (see page 597), and further efforts to increase rubber production from this source are anticipated.

Supplies of reclaimed rubber are adequate at present, government officials said, but export requirements and increased use resulting from curtailment of crude rubber consumption may make necessary eventually the issuance of an order to restrict its use to essential products only.

CALENDAR

Mar. 2-5. A.S.T.M. Committee Week and Spring Meeting. Cleveland, O.
Mar. 3. Los Angeles Rubber Group.
Mar. 6. Nichols Medal Award. New York, N. Y.
Mar. 12-13. SAE. National Aeronautic Meeting. Hotel New Yorker. New York, N. Y.
Mar. 17-18. N.A.W.M.D. Twenty-Ninth Annual Convention. Hotel Astor, New York, N. Y.
Mar. 20. Akron Rubber Group. Akron City Club.
Mar. 20. New York Rubber Group. Building Employers' Trade Assn. Clubrooms.
Mar. 20. Rhode Island Rubber Club. Narragansett Hotel, Providence, R. I.
Mar. 23-25. A.S.M.E. Spring Meeting. Houston, Tex.
Apr. 14-17. 1942 Packaging Exposition and Conference. Hotel Astor, New York, N. Y.
Apr. 20-21. Industrial Accident Prevention Assns. Convention. Royal York Hotel, Toronto, Ont., Canada.
Apr. 20-24. A. C. S. 103rd Meeting. Memphis, Tenn.
May 2. Chicago Rubber Group. Congress Hotel.

WPB Sets Specifications for Rubber Goods

Seeking greater conservation of the country's precious stocks of crude rubber, the War Production Board of February 11 laid down stringent rules for manufacturers to follow in making various essential rubber products. Issuing the first order of its kind, Supplementary Order No. M-15-b-1, WPB outlined specifications limiting the percentages of crude rubber in mixtures used to make these products. Savings of at least 25,000 tons of rubber a year are expected.

It should be pointed out that the order also imposes limitations on the use of reclaim in the listed products.

The specifications, while technical, have a simple purpose: to save rubber without sacrificing safety. Most of the savings—at least 10,000 tons annually—will be accomplished under the specifications for tires and tubes and capping stock for civilian use. There will be approximately 15% less new rubber in civilian tires. Separate specifications are set forth for tires and tubes to fill war orders. The result may be to lessen the life, but not the safety, of tires and tubes, rubber coats for firemen and policemen, rubber boots and overshoes, gym shoes, and other designated products. The service to be obtained from these goods will depend largely upon the care given them. Unless the user employs care, he cannot expect to get normal wear and service.

The specifications, drafted by technical experts in the Rubber and Rubber Products Branch after weeks of study and consultation with industry engineers, are but a preliminary step in a plan to regulate the consumption of crude rubber in almost all rubber products. The initial order covers the following ten classes: hose and tubes; conveyer, elevator, and flat transmission belts; occupational and protective clothing; jar rings; tennis and gym shoes; waterproof boots, pacs, arctics, gaiters, and overshoes; tires, casings, tubes, and retreading materials; bicycle tires; fire and mill hose; and tires, casings, and tubes to fill designated war orders.

As an example of the drastic revisions made in manufacturing practices, the order prohibits use of more than 7½ ounces of crude rubber in a bicycle tire, complete with tube. Manufacturers have been using approximately 17 ounces. The specifications limit severely the amount of rubber that can be put into various types of boots and overshoes and state that they can be made only in black. Approximately ½-pound of new rubber can be used per pair, as compared with a customary ¾-pound.

Firemen and policemen will have to wear protective clothing of a lighter type than that now in use, but they will have the safety that they now enjoy. The idea is that they probably will not get the same wear out of the new clothing, unless they use care.

Manufacturers are given time in which to alter their methods to conform with the new requirements. Although the order is effective immediately, some of the specifications do not have to be adopted until March 2. The specifications on civilian tires take effect February 16; while those on capping stock must be adhered to immediately.

Prior to the formal announcement of these specifications the Rubber Industry Advisory Committee was told that the Army and Navy have made substantial savings in use of crude rubber, and that studies are being made daily to determine where greater conservation is possible. Savings already accomplished have resulted in part from reduction of the crude rubber content of Army-type gas masks and Navy degaussing cable, elimination of sponge rubber from the seats of Army "jeeps", and elimination of some uses of sponge rubber in tanks.

The Committee was asked to furnish information on the location and availability of plant floor space and machines that might be used in conversion to war work.

Unvulcanized Scrap for Civilian Goods

With crude rubber reserved for the manufacture of essential products, the WPB on February 19 made available limited supplies of certain scrap rubber for use in less essential civilian articles. Amendment No. 4 to Supplementary Order No. M-15-b (see page 582) removes unvulcanized scrap rubber compounds from the definition of rubber. Such compounds are largely unusable for products permitted by M-15-b. Under previous terms of the rubber regulations, however, unvulcanized scrap could not be utilized for making unpermitted products.

WPB officials said that this amendment would permit limited manufacture of certain civilian products for which crude rubber or latex cannot be allocated and will serve to maintain a number of rubber company employes who would otherwise be displaced.

Diphenylamine Allocated

Diphenylamine, important chemical synthesizer and reagent, went under complete allocation control on February 1, according to the terms of General Preference Order M-75. The order provides for monthly allocations and regular reports upon which allocations will be based. Diphenylamine is used in the production of powder and other explosives, soap, sheep dip, insecticides, dyes, and rubber chemicals. New production is being considered to relieve the current shortage.

Diphenylamine is one of the essential intermediates in the production of antioxidants which are derived to a large extent from secondary amines. In itself somewhat volatile, diphenylamine may be reacted with other chemicals to form more stable compounds. Because of the importance of antioxidants in preserving the life of rubber goods, and thus in conserving our present rubber supplies, the continued availability of diphenylamine for the production of rubber chemicals is of vital importance.

Industry Branches Grouped

Philip D. Reed, chief, Bureau of Industry Branches of the Division of Industry Operations, announced January 29 that 12 of the 14 branches under his direction had been broken down into three groups, each of which is under the immediate supervision of an assistant chief. Because of its decentralization, with an office in Detroit, the automotive branch will continue to report directly to Mr. Reed as will the rubber branch.

R. R. Guthrie, chief of the Textiles Branch under OPM and the War Production Board, will continue as such and also will supervise the operations of the food, electrical supplies, and consumers' durable goods branches.

W. C. Shorter will remain as chief of the containers branch and will coordinate the following branches: lumber and building materials, plumbing and heating, health supplies, and safety and technical equipment.

John R. Kimberly, who was consultant in the industrial and office machinery branch, OPM, will supervise the industrial and office machinery, pulp and paper, printing and publishing, transportation and farm equipment, and communications branches.

Affecting Motor Vehicles

The ban on sales of 1942-model light, medium, and heavy trucks and truck trailers was again extended this time from February 11 to February 28, because plans for rationing such vehicles have not been fully developed.

Amendment No. 3 (January 23) to Limitation Order L-1-a to Restrict the Production of Medium and Heavy Motor Trucks, authorizes a 34% rise in March output of medium and heavy trucks over production in March, 1941, but rules that such trucks cannot be equipped with tires, casings, or tubes. Whenever one of these vehicles, part of a planned stockpile for essential civilian uses, is released for sale under a forthcoming rationing order, four tires and tubes undoubtedly will be provided by governmental authority if not otherwise obtainable. Thus deterioration of tires mounted on vehicles standing for long periods in dealers' storerooms will be avoided.

Orders to facilitate production of spare parts for medium and heavy trucks, truck trailers, passenger carriers, and school bus bodies were issued January 22. Under Limitation Order L-35, producers may make during the first quarter of 1942, 60% of the number of designated replacement parts sold by them for replacement purposes during the last half of 1941. Under Limited Preference Rating Order P-107, an A-3 rating is assigned to deliveries of materials going into the manufacture of these spare parts.

To hasten conversion of the automotive industry to war work, the WPB on January 23 permitted sharp acceleration in production of spare parts for passenger cars and light trucks to form a stockpile for future needs. Thus producers may make during the first half of 1942 up to 150% of the number of each of the replacement parts they sold for that purpose during the year 1941.

An A-10 preference rating is made available to producers and suppliers to obtain materials for spare parts, but this can be applied only for materials for the following functional repair parts and components: engine, clutch, transmission, propeller shaft, axles, brakes, wheels, hubs, drums, starting apparatus, spring suspension, brackets and shackles; the exhaust, cooling, fuel, lubricating and electrical systems, including generators, lights, reflectors and batteries; and gages, speedometers, motors, fuses, flares, directional signals, rear-view mirrors, windshield wipers, control mechanisms, steering apparatus, and driving gears.

Other Orders

Last month the WPB issued four more Priorities Regulations. No. 3 covers a new form of application blank, mandatory on and after March 2, and its use for individual preference ratings; while No. 4 formally validates all preference rating certificates issued by the Division of Priorities of the late OPM. According to Priorities Regulation No. 5 all priority forms and orders, with a few exceptions, may now be reproduced. No. 6 abolishes the Priorities Critical List of the Army and Navy Munitions Board as a limitation upon the application of the preference rating assigned by any General Preference Order, Preference Rating Order, Limited Preference Rating Order, or any other Order heretofore issued by the OPM Director of Priorities of Director of Industry Operations of the War Production Board.

To meet Army and Navy demands on the radio manufacturing industry and to conserve critical materials the WPB on January 23 issued General Limitation Order No. L-44 to Restrict the Production of Radio Receivers and Phonographs, which sharply cuts production of receiving sets for civilian use and also phonographs and radio-phonograph combinations.

Interpretation No. 1, published January 23, to Preference Rating Order No. P-43 granting priority assistance to research laboratories, emphasizes that the preference rating assigned cannot be used for construction or expansion of laboratory buildings.

The rayon industry was notified January 29 that output of high-tenacity yarn must be increased for military needs. Such yarn now is being used in making tires for heavy-duty trucks and buses.

Interpretation No. 1 of Preference Rating Order No. P-100, issued February 13, forbids the use of critical materials, including rubber, for highways and highway repairs when less scarce materials can be substituted and also points out that highway departments which apply preference ratings under the terms of the order are subject to the general provision that scarce materials must be eliminated by change of design or substituted for whenever practicable.

Amendment No. 2 (February 14) to Preference Rating Order No. P-29 provides that manufacturers of specified health supplies now need only sign an endorsement on their purchase orders in the application of the A-10 rating assigned and no longer must furnish their suppliers with copies of P-29.

WPB on February 16 issued Limitation Order L-31 to Curtail Consumption of Natural Gas in order to assure adequate supplies of natural gas and mixed natural and manufactured gas for war production.

Amendment No. 2 to Limitation Order L-20 to Limit the Use of Cellophane and Similar Transparent Materials Derived from Cellulose extends the order for another 30 days, this time until March 17.

Donald M. Nelson, chairman of the War Production Board, in Supplementary Directive 1-B issued last month, has delegated to the Office of Price Administration the authority to ration retreaded or recapped tires and retreading or recapping materials at wholesale as well as retail levels.

Pending adoption of a method of distributing tire retreading and recapping machinery equitably throughout the nation, the WPB has ordered all manufacturers of such equipment to cease immediately filling any orders except those supported by preference rating certificates.

Priority assistance will not be granted for the construction of air raid shelters in the United States, it was announced January 24 after a conference of WPB and OCD officials. At the same conference, however, it was agreed that by employing substitutes wherever they could be safely used, materials could be provided to fill OCD requirements for fire hose, surgical instruments and

dressings, stretchers, protective helmets, boots from reclaimed rubber, and protective clothing for air raid wardens and other civilian defense officials. Requirements for other kinds of civilian defense equipment are being given further consideration. Black paint, board, or textile coverings for windows of private plants working on war orders will be available, but officials at the conference did not recommend provision of such materials for other private buildings or homes since both paint and textiles are more urgently needed for other war purposes.

Makers of conveyer machinery and auxiliary equipment are eligible for priorities assistance under the Production Requirements Plan and should file the necessary application forms (PD-25A) with the industrial and office machinery branch as quickly as possible, it was announced February 3. Assistance previously had been available under Preference Rating Order P-78, which expired January 31. Under this order, an A-3 rating was applied to deliveries of necessary materials.

Labor Director Sidney Hillman, on February 20 urged all workers who use private automobiles to get to their jobs to establish "informal transportation clubs" to prolong the service of their tires.

The cargo of the German motorship *Willmoto* interned at San Juan, P. R., before our entry into the war, was among the materials seized recently by order of the inventory and requisitioning section, WPB. Included in the cargo were 4,000 tons of crude rubber and 100 tons of truck tires.

Personnel Appointments

The Bureau of Industry Advisory Committees formed an electric heating pad manufacturers industry advisory committee, including H. L. Stiles, of the Bridgeport, Conn., plant of General Electric Co., and F. Thatcher Lane, of Seamless Rubber Co., New Haven, Conn.

Ernest W. Reid, assistant chief of the Chemicals Branch, Division of Materials, WPB, since its formation, last month was made chief, succeeding Edward W. Weidlein, who will be retained in the organization as senior consultant. Dr. Weidlein has been devoting part of his time to the Branch, with his efforts centered recently on development of the synthetic rubber program. He will continue this responsibility for the Materials Division.

T. Spencer Shore, on leave as vice president and treasurer of The General Tire & Rubber Co., Akron, O., has been made chief of the Bureau of Industry Advisory Committees, succeeding Sidney J. Weinberg, appointed assistant to Donald M. Nelson, WPB chairman. Mr. Shore was formerly assistant chief of the bureau.

C. H. Matthiessen, Jr., has been placed in charge of the priorities program in the Division of Industry Operations.

OPA Rations Retreads, Issues Scrap Prices, Etc.

The Office of Price Administration, Washington, D. C., last month issued regulations restricting the sale and distribution of retreaded and recapped tires (see pages 581-582) in an effort to meet essential needs of tires and safeguard an adequate supply of camelback for vital uses.

To guard against further increases in scrap rubber prices, Price Schedule No. 87 (see pages 583-584, 616) was issued January 13 setting ceilings on various grades of tire and inner tube scrap.

Amendment No. 1 to Price Schedule No. 56 revises certain prices of reclaimed rubber, as shown below.

Eight appointments to the division of accounting, analysis, and review of OPA were announced February 13 by H. F. Taggart, chief, including John S. Bartlett as chief of the rubber section.

Amendment on Reclaim Prices

Discontinuance of cash discounts on sales of reclaimed rubber is permitted by Amendment No. 1 to Price Schedule No. 56 issued February 3 by the OPA. The amendment also fixes a uniform price ceiling of 12¢ a pound for red tube reclaimed rubber having a specific gravity of 1.15 to 1.32, delivered in carload lots at consumers' plant.

AMENDMENT NO. 1 TO PRICE SCHEDULE NO. 56—RECLAIMED RUBBER.[1]

Sections 1315.51 and 1315.59 are hereby amended by adding a new Paragraph (c) to each, and section 1315.53 is amended by adding at the end thereof a new sentence:

1315.51 *Maximum Prices for Reclaimed Rubber.*

(c) Notwithstanding the provisions of paragraph (b) above, the maximum price for red tube reclaimed rubber shall be as follows:

(1) Delivered to purchaser's plant in carload lots—12¢ per pound;

(2) Delivered to purchaser's plant in less than carload lots—12¾¢ per pound.

1315.53 *Evasion.*

Provided, That nothing contained herein shall be construed to require the offering of any cash discount or to prevent the making of sales on a net basis.

1315.59 *Definitions.*

(c) "Red tube reclaimed rubber" means reclaimed rubber made from red inner tube scrap rubber and having a specific gravity of from 1.15 to 1.32.

(E. O. Nos. 8734, 8875, 6 F. R. 1917, 4483)

This amendment No. 1 shall become effective February 5, 1942.

Issued this 30th day of January, 1942.

LEON HENDERSON
Administrator

[1] Title 32—National Defense Chapter XI—Office of Price Administration, Part 1315—Rubber and Products and Materials of Which Rubber Is a Component.

OEM Defense Photo

Arthur D. Newhall, Chief, Rubber and Rubber Products Branch, Division of Industry Operations, WPB

February Quotas for Tires and Tubes

State tire and tube rationing quotas for February, including for the first time the number of "retreads" available between February 19 and 28 for List A eligible trucks, buses, and other heavy vehicles under the retread rationing plan, were released February 15 by the OPA. (See table on page 626.) Issuance of the month's quotas was delayed to complete work on the rationing plan for retreaded and recapped tires, announced February 11 and effective February 19. From now on quotas for each month are expected to be made public toward the close of the preceding month.

The drop in February quotas under January figures reflects the fact that winter weather conditions throughout the United States always make February the low month for tire demand. Besides January quotas were purposely set high to see how actual demand would work out.

The quota of retreaded truck tires for February 19-28 was 88,505 and reserved for eligible trucks on List A of the rationing regulations. March quotas of such tires will make allowance for such trucks on List B as local rationing boards determine are entitled to retreads because of their importance to community or nation. List B trucks may apply for retreads between March 1 and March 20, out of March quotas, but the local boards may not issue retread purchase certificates for List B trucks until March 25 and then only if List A truck eligibles have been satisfied.

No passenger-car retread tire quotas were set for February because no camelback was made last month for that purpose. Moreover as the WPB has not yet announced the quantity and type of camelback to be produced in March, and that for passenger-car tires seems doubtful, no OPA retread quotas have been set. If, however, the camelback is available, most of the passenger-car retreads will be for List B eligibles because, under the revised regulations, List A passenger cars cannot obtain a retreaded tire unless unable to get a new one under the new tire quotas.

Quotas are valid only for the month for which they are set, and unused portions may not be carried over to the next month.

Other Tire Rulings

Provisions whereby tire recappers and retreaders may purchase replacements for inner tubes used as a substitute for airbags in the recapping or retreading process are included in Amendment No. 6 to Supplementary Order No. M-15-c announced February 12 and effective February 13. The amendment and a memorandum sent with it to all state rationing administrators and local boards describe the procedure to be followed by retreaders in purchase of the tubes. Precautionary measure to prevent abuse of the replacement privilege also are outlined.

In applying for replacements, the retreader must attest that he has no more than one serviceable airbag or tube of the required size for each operating mold in his shop and must also make affidavit that he will use the new tube solely for recapping or retreading purposes. Airbags or tubes for which replacements are sought must be turned in when new ones are bought.

Restriction also is put upon the frequency of replacements permitted—not more than two tubes within any calendar month for each operating mold.

Amendment No. 7, issued February 18 and effective February 16, relates to the transfer of new tires from one place to another and also narrows the restrictions applicable to tire warehousing.

Trucks carrying beer from the brewery to the wholesaler or retailer are eligible for new tires, according to J. K. Galbraith, assistant administrator of OPA, and Ben W. Lewis, price executive of the Rubber and Rubber Products Section of OPA. For tire rationing regulations include in the eligible class for new tire trucks used solely for transporting finished products to other than the ultimate consumer for his personal, family or household use, and beer is a finished product within this section."

Attorneys of the Rubber and Rubber Products Section said no special ruling had been made in the case of beer trucks since they were on the eligible list for tires under the regulations.

OPA officials, commenting upon the report that tire rationing regulations might be eased to prevent deterioration of tires in storage, said recently that they would "cross that bridge when they came to it." For the present, it was pointed out, there are far more pressing problems with reference to the tire situation. Deterioration will not become a serious factor for some time, it was declared. Meanwhile it was urged that every precaution be taken to protect tires in storage against deterioration.

Nation-wide inspection of stocks and records of dealers in new tires and tubes is under way in order to determine the extent of violation of the tire-rationing regulations, OPA Administrator Henderson announced January 29.

Plans are being formulated to provide truck and bus fleet operators with emergency ration certificates so that essential long-haul trucks and buses will be able to replace blown tires and tubes on the road without undue delay.

The OPA has released "Tire Rationing Regulations (Revised) Establishing a Program for Rationing Tires and Tubes, Retreading and Recapping of Tires, and Camelback", issued February 9, 1942, effective February 19, 1942 [except that section 803(b) is effective February 16, 1942], which supersedes the "Tire Rationing Regulations", issued December 30, 1941, effective December 30, 1941, and Amendment No. 1 thereto, issued January 12, 1942, effective January 12, 1942. Citations: Tire Rationing Regulations, 7FR72, January 3, 1942; Amendment No. 1 thereto, 7FR257, January 14, 1942; Supplementary Order No. M-15-c, 6FR6792, December 30, 1941, amended, 7FR121, 350, 434, 473, January 6, 17, 21, 23, 1942; Directive No. 1, 7FR562, January 28, 1942, Supplementary Directive No. 1, 7FR562, January 28, 1942.

Additional Ceilings Set

Price Schedule No. 82, issued January 30, establishes formal price ceilings on wire, cable and cable accessories at the October 15, 1941, levels. Products subject to the schedule follow: rods, bare wire, weatherproof wire, magnet wire, non-metallic sheathed cable, paper power cable, rubber sheathed cord and cable, rubber power cable, building wire, asbestos insulated power cable, varnished cambric insulated power cable, telephone and telegraph wire, telephone, telegraph, or signal cable, special purpose communication or signal wire and cable, armored conductors, shipboard cable, flexible cord and cord sets, and cable accessories.

Ceiling prices on salicylic acid became effective under Schedule No. 103, OPA, on February 16. The carlot maximum price is now 28¢ per pound for producers and primary jobbers and 36¢ per pound for resellers, both f.o.b. seller's shipping point. In the rubber industry, salicylic acid is used as a retarder of vulcanization.

Amendment No. 1 to Price Schedule No. 63—Retail Prices for New Rubber Tires and Tubes—to provide special treatment for certain manufacturers and distributers whose situation differs from the general run of tire producers was announced February 3, and went into effect February 5.

Manufacturers of rubber shoe products were requested February 7 by Leon Henderson, Administrator, Office of Price Administration, not' to increase their net prices on heels and soles, as a result of Treasury Decision 5107. This decision, issued by the Bureau of Internal Revenue, applies a 10% tax on rubber products to such heels and soles.

OPA will not object, however, to specific addition of the amount of the tax actually paid on any item, provided it is billed separately.

Evaluation of Rubber Schemes

With our chief source of crude rubber threatened by war in the Southwest Pacific, the National Bureau of Standards has outlined a procedure for evaluating the numerous new plans offered for the production of this vitally important raw material, according to the Department of Commerce, with a view to safeguarding the interests of both the government and the public. The procedure is the same as that followed by private industry for determining the merits of any new process and is applicable to proposals for growing, synthesizing, or reclaiming rubber.

Rubber experts of the Bureau point out that a potential investor, sponsor, or other party interested in finding out the commercial possibilities of a new process should take five specific steps. They are:

1. An explicit, written description of the process should be obtained, together with a statement of the yield of rubber to be expected.
2. This description should be reviewed by a disinterested authority to determine whether or not it is consistent with known facts and accepted scientific principles.
3. If the process appears practical, it should be tested by having a competent laboratory repeat it independently of the inventor.
4. If the process yields rubber as claimed, samples should be tested to determine the quality and probable commercial value of the rubber.
5. If the foregoing laboratory tests are satisfactory, the process should be operated on several successively larger scales until a scale is reached in which the product is made in commercial quantities.

Decision as to whether or not a process is to be used in large-scale production should be reserved until all five steps have been passed successfully. It is pointed out that the rubber producing processes now being pushed into large-scale production to meet emergency war needs are not new or untried. All of them have been in the development stage for a number of years and have a background of successful commercial use as well.

Expected yield is important since many of the ways in which rubber can be obtained are not practical because the yield is too small. Thousands of plants contain small amounts of rubber, and hundreds have been tested at one time or another, but only a very few yield enough to warrant their being considered for use in production.

A critical review of proposed processes for obtaining rubber usually eliminates most of them either because they are not new or because they are not based on sound scientific principles. For example, the production of a rubber-like material from vegetable oil and sulphur is often heralded as a new discovery despite the fact that the product—factice—has been known for a hundred years and is a common article of commerce.

The claim is sometimes made that because a process has been patented, it has been tried out and approved by the government. Such is not the case since a patent is designed simply to protect the inventor in his use of a process, but does not testify to its practicability.

Jesse Jones on the Rubber Situation

In a statement before the House Committee on Banking and Currency on February 2 and 3, Jesse H. Jones, Federal Loan Administrator, predicted that we should be getting all the rubber we need out of the Far East by the end of 1943 or the first part of 1944. However, he held that it was highly necessary to conserve rubber and to ration it very severely.

On the question of supplies, Mr. Jones said that we are getting practically all the rubber that is now being produced in the Dutch East Indies, probably 30,000 to 40,000 tons a month. He pointed out that we had received 114,000 tons since Pearl Harbor, and 114,000 additional tons had been shipped since then. During January, 58,000 tons were shipped, and 76,000 tons received. Of the 114,000 tons received, 70,000 tons were allocated or sold so that the stock pile here increased 44,000 tons in that period. Losses by sinkings were estimated at 1,850 tons, while 3,600 or 3,900 tons in the Philippines were reported to be in jeopardy. Total U. S. Rubber imports during 1941 were reported at 1,030,000 tons by Mr. Jones, but he pointed out that an unusual amount of this rubber had been used. In speaking of rubber prices, Mr. Jones held that crude rubber would have gone to $1 a pound if it had not been for this country's pre-war buying policy. Total crude rubber stocks in this country were estimated at 650,000 tons by the Loan Administrator, who said that he did not think that rubber companies had much more rubber than they had reported to the government.

Mr. Jones was not optimistic about the possibilities of obtaining rubber from South America and declared that production there within a year's time might run as high as 50,000 tons, but no higher. After citing the difficulties involved, he concluded that the undertaking is too big to do us a great deal of good, although we have been trying to get rubber from South America for more than a year. As an incentive, a price almost double that paid for rubber from the Dutch East Indies has been offered.

Later in respect to a question as to whether there were only 50,000 tons of wild rubber in Brazil or if that amount represented all that could be obtained with available facilities, Mr. Jones said he was unable to offer authentic advice on that point but that he did not believe that a great deal of rubber could be obtained from there under 10 or 15 years.

War Department estimates were cited which indicated that Army rubber needs for the two years, 1942 and 1943, would be about 400,000 tons; about 40% in 1942 and 60% in 1943. No comments were made in respect to the demands by the Navy and other essential wartime production.

Mr. Jones stated that the major portion of the 400,000-ton synthetic rubber capacity, in addition to that already arranged for, should be in production in the Spring of 1943, with the balance in production by the fall or late summer of that year. With the $400,000,000 for these plants, Mr. Jones said he hoped to surpass the 400,000-ton capacity and reach a production of 500,000 tons per year. Pointing out that patents on synthetic rubber production had been pooled, he said that further efforts were now being made to pool patents on raw material production (butadiene, etc.). Plant locations will depend largely upon where raw materials are available. It was emphasized that the plants would not be leased, and that the government would wholly own the plants and the synthetic rubber produced. The operating manufacturer will merely be paid so much a pound for producing the raw material or synthetic rubber.

In discussing the after-the-war effects of these plants, Mr. Jones said that it would be up to Congress to decide if operation would be continued, but he warned that their operation would put millions of people out of work in this country and in normal rubber-producing countries; it would kill the vast market for our finished products that are traded for rubber in normal times. According to the Loan Administrator, we are justified in going into large-scale synthetic rubber production only as a war measure, but he did agree that the program would be worth what it costs to insure against exhorbitant rubber prices after the war.

Wild Rubber Survey

Development of a wild-tree rubber program in this hemisphere passed the discussion stage in Washington recently with the announcement that a technical mission had been sent to survey the main production areas in South and Central America. The project is under the direction of Earl N. Bressman, Office of the Coordinator of Inter-American Affairs, in collaboration with the Board of Economic Warfare, the WPB, the Department of Agriculture, and the RFC.

The mission will attempt to rationalize the various conflicting statements issued from time to time concerning potential *Hevea* rubber tonnage for Brazil and other areas. These estimates have ranged from 30,000 to 100,000 tons. Jesse Jones, testifying before a Congressional Committee, recently placed the figure at not more than 50,000 tons. The Government of Brazil recently evaluated potential tonnage at 80,000 tons.

Estimates place the number of trees in the Amazon Valley at 30,000,000.[1] The U. S. Government technicians will attempt a realistic report on these production figures. At the outset they will report data on potential new and increased production in the various areas, on the facilities for getting out the wild tree rubber, and particularly transportation equipment. Later they will devote more attention to details of buying, distribution, and long-term possibilities of rubber cultivation on a large scale.

The mission has been divided into several parties, as follows: Mexico, Honduras, San Salvador, Nicaragua, Costa Rica, and Panama—Carl D. Kennedy, leader, and George L. Seeley; Columbia and Ecuador—Marshall G. Carlton; Peru and Bolivia—Raymond Russell; Brazil—Three separate expeditions including Paul B. Weiner, Wallace E. Manis, Harold E. Gustin, Michal A. Polli, B. B. Worth, Homer Pease, and several others will join this advance party later.

At this stage it is considered probable that the waterways will be used to get most of the tonnage out. Although the formation of an overall plan will await reports from the field experts, discussion points toward paying a higher price for South and Central American wild-tree rubber than we have been paying for our past supply. This may be in the form of a bonus to encourage getting it out. A plan discussed is to set a price plus bonus at two or three ports on an experimental basis.

Development of rubber production in the Amazon Valley is part of a program now being drawn up which will be known as the Amazon Valley Development Project, presented by Sumner Welles, Acting Secretary of State, to the Brazilian Government recently. He recently announced that negotiations had developed which assure Brazil of the necessary equipment to assist industries essential to the war program.

Sending of the technical mission followed closely the arrival of Arthur De Souza Costa, Brazilian Finance Minister, in this country. Dr. De Souza Costa expressed the optimistic view, upon his arrival in Washington, that Brazil will be able to supply the future rubber requirements of the United States. He said that Brazil asked only for technical assistance in undertaking this program. The Minister refused to be definite concerning the ability of Brazil to fill our requirements "in the future", other than to say it would not be the "far future."

Late last month it was reported that arrangements were being made to form a Brazilian-United States rubber corporation, to obtain wartime rubber needs for this country, and to provide future rubber supplies that will make the United States less dependent on the Far East. Problems of capitalization and organizational structure are now being worked out.

The Bureau of Census, Washington, D. C., announced that in 1939 sales of rubber and surgical sundries accounted for 10.8% of total drug-store sales. A breakdown revealed that for independents the figure was 11%, for chain stores, 10.2%; for drug stores with fountains, 10.3%, without, 13.1%.

[1] Concerning the yield or rubber per tree, P. Schidrowitz, in his book, "Rubber" (Methuen & Co., Ltd., London, 1911, p. 30), has this to say: "It would appear, then, that the Amazon tree will give an annual yield of about five pounds dry rubber, but it is at least doubtful—I have not been able to collect any data on this point—whether any large proportion of the trees show as high a yield as this over a succession of years."

Revised Guayule Bill Passed by Senate

The Senate passed on February 19 and sent to the House for approval legislation (Senate 2282) authorizing planting of 75,000 acres of guayule and other rubber bearing plants anywhere in the Western Hemisphere "where the best growth and yield may be expected." The bill was a Senate revision designed to meet President Roosevelt's veto on February 17 of the guayule bill passed February 5 by the House and February 9 by the Senate which included a House amendment confining the proposed operations to United States territory. Mr. Roosevelt stated that the bill, as amended by the House, contradicted the spirit of the resolution of continental solidarity in the obtaining of strategic materials passed unanimously by the 21 American republics on January 28 at the meeting in Rio de Janeiro, Brazil, of the Ministers of Foreign Affairs of those nations, and would seriously handicap the joint war effort.

The bill authorizes experimental work in development of guayule as a source of rubber supply. The Secretary of Agriculture is authorized to acquire patents, properties, and facilities, which include 23,000,000 pounds of tested guayule seed, of the Intercontinental Rubber Co. at a cost not to exceed $2,000,000.

Nelson and Jones Statement

In a statement issued February 14, Donald M. Nelson, chairman of the War Production Board, and Jesse Jones, Secretary of Commerce, said, in part:

"It is extremely important that every citizen understand our situation in rubber. We cannot win the war unless our military forces have an ample supply of rubber. . . .

"The rubber we have today, plus the rubber that is on its way in and the rubber we shall eventually make in our new factories, is all the new rubber we can count on at this time. There is about enough to enable us to complete our great armament program—but there is not going to be any to spare. We dare not waste any.

"So we have made our choice. . . .

"We should not be rationing rubber today if our national safety did not depend on it. Everyone of us who is used to riding on rubber without giving the supply a thought should look at his tires and say: 'That's all there is. There isn't any more'—and proceed accordingly until adequate supplies are once more assured.

"Your government is aware of the seriousness of this rubber supply problem and is working on all fronts to alleviate this situation as much as possible."

The railroad industry, in meeting the production schedule recently outlined for it by the former SPAB, 36,000 freight cars by May 1, will require a considerable amount of strategic materials including 570 tons of rubber.

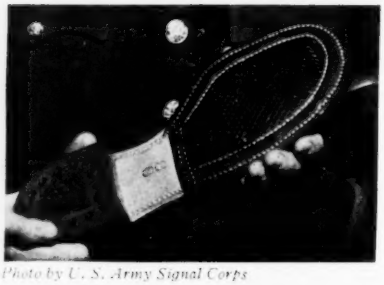


Photo by U. S. Army Signal Corps

The Army's New Rubber Tap Sole Described on Page 496 of Our February Issue

The War Department, Washington, D. C., wishes to retract the story about ten base retreading shops that appeared on page 496 of our February issue. The Army reports, however, that plans for these shops are being considered.

Senator W. Lee O'Daniel, of Texas, recently announced that E. P. Schoch, director of the Bureau of Industrial Chemistry of the University of Texas, paid a visit to Washington to interview the federal departments interested in the production of synthetic rubber. Dr. Schoch's research work has been along the lines of acetylene production from natural gas, and other similar work.

The Office of Civilian Defense, Washington, D. C., has issued the following warning regarding the use of old gas masks:

"Gas masks that do not bear the approval of the Chemical Warfare Service for use against war gases should not be used regardless of any claims of the manufacturers. See your local defense council officials for advice concerning masks approved by this service.

"Gas masks of the first world war type are now worthless, due to the deterioration of the filling, stiffness, and age of the face piece and other components."

John B. Kelly, director of the physical fitness program, OCD, has taken up with Donald M. Nelson, chairman of the War Production Board, the question of treatment to be given the manufacture of athletic equipment during the war emergency in the interests of civilian morale. Mr. Nelson asked Mr. Kelly to make a survey of requirements of critical materials needed for production of athletic equipment.

RFC to Finance Tire Marketing

A plan whereby the Reconstruction Finance Corp., Washington, D. C., would finance the orderly carrying and marketing of passenger automobile tires and tubes under the OPA rationing program is now being developed as a result of conferences of RFC and OPA with tire manufacturers, according to recent announcement of Jesse Jones, Federal Loan Administrator. Complete details of the plan will be worked out shortly and will then be made public, the Administrator said.

Reclaim Restrictions Foreseen

The Rubber and Rubber Products Branch expects to have completed shortly after March 1 an inventory of the reclaim industry which will determine the nature and extent of restrictions to be imposed upon reclaimed rubber. Lack of data on reclaimed rubber production explains why rationing or some form of control has not been adopted before now, according to the Branch officials.

It is pointed out that crude rubber limitations were comparatively easy to establish since crude rubber is a single product. Reclaimed rubber, on the other hand, has 15 basic grades, which present an involved problem.

The survey now in progress by the Rubber and Rubber Products Branch seeks to determine the capacity of the reclaim industry to manufacture, the actual production, and the demand. Until all these factors have been evaluated, a rational conservation program cannot be set up.

As soon as all data are in, the Branch will move swiftly to place a limitation program in operation, it was disclosed.

Scrap Salvaging Campaign

Manufacturers in Erie, Pa., have successfully launched a comprehensive plan of industrial conservation to secure the active cooperation of industry in the economic use of raw materials and the salvaging of scrap necessary for the nation's defense efforts. An executive committee and sub-committees were formed, each to cover certain materials. Their aims and objectives follow: wrecking abandoned and obsolete machinery and equipment; utilization of all critical materials to the best advantage; minimization of waste and spoilage; reuse wherever possible, of blanks, cutdowns, short ends, clippings, etc.; selective handling and segregation of scrap and overage at the source; avoidance of contamination; speeding the return of scrap and waste materials through existing channels to mills and refineries. Then each plant in the community was organized to carry out the work and make reports.

It is expected that this plan will serve as a model for other localities in the nation.

Aluminum Co. of America, Pittsburg, Pa., recently showed its new technicolor motion picture, "Unfinished Rainbows", produced by Wilding Picture Productions, Inc. The film, which depicts the history of the aluminum industry, was made in Hollywood with Hollywood character actors and is now available for distribution.

National Association of Waste Material Dealers, Inc., Times Bldg., New York, N. Y., will hold its twenty-ninth annual convention at the Hotel Astor, N. Y., March 17 and 18. The banquet is scheduled for evening of March 18.

EASTERN AND SOUTHERN

Effects of War Indicated at Notion Show

Exhibitors of rubber products and plastic-coated materials at the Seventh National Notion & Novelty Exhibit were almost unanimous in their policy of not accepting any new accounts and in proportioning available stock to old customers. A few manufacturers were able to guarantee orders on certain products in the future, since the raw material they used would not interfere with defense requirements. The show was held in the Hotel Pennsylvania, New York, N. Y., February 2 to 7 with over 100 exhibitors.

The transition from rubber to non-rubber items evoked much interest. The Plymouth Rubber Co., Inc., Canton, Mass., featured pyroxylin-coated fine nainsook for baby pants and dress shields, rubber soles, heels and friction tape made of reclaimed rubber, and non-rubber flannelette baby pads. The I. B. Kleinert Rubber Co., New York, issued a statement of policy to the trade assuring continued delivery and production on a number of its products and further development of non-rubber items. No new accounts would be opened, but orders would be filled on the basis of last year's month by month purchases until the supply is exhausted. Kleinert's display included its usual complete line of bathing accessories, dress shields, aprons, garment grippers, rubber sheeting, and girdles.

Companies featuring Pliofilm products such as bowl covers, garment bags, boudoir ensembles, aprons, lampshade covers, etc., included the Protex Products Co., Jersey City, N. J.; Al-lon Mfg. Co., Inc., Baltimore, Md.; Richards, Boggs & King, Inc., Chicago, Ill.; A. L. Siegel Co., Inc., New York; and Transparent Cover Co., Chicago. Among these items were also whisk brooms having Pliofilm bristles, featured specifically by S. E. Weber, Akron, O., and Richards, Boggs & King, Inc. The Warren Featherbone Co., Three Oaks, Mich., this year again devoted most of its exhibit to its line of Koroseal products including rainwear, umbrellas, closet ensembles, aprons, etc. Vinylite products were well represented in the show in bathroom accessories, make-up capes, shower caps, and aprons. Le Chalet, New York, showed white aprons for nurses and defense workers, as well as an attractive line of Vinylite kitchen curtains, aprons, bowl cover sets, shower curtains, and make-up capes.

Other exhibitors of rubber goods included Mackie-Lovejoy Mfg. Co., Chicago, jacket elastic, suspenders, Lastex belting; The Hobar Co., New York, rubber-tipped clothes pins for drier sets and blanket anchors; Beyerle Mfg. Co., Inc., New York, girdles, rubberized aprons, dress shields; Sturm & Scheinberg, Inc., New York, girdles, brassieres, garters, suspenders; Dritz-Traum Co., Inc., New York, elastic sewing thread; A. Stein & Co., Chicago, "Hickory" products, "Per-fit" girdles, panties; Venus Corp., New York, girdles, sanitary specialties, crib sheets; Delmont Products Co., New York, "Delatex" non-rubber, waterproof closet accessories; Seal Sac, Inc., Fall River, Mass., Pliosheen food covers, "Cordura" and "Marquisette" closet accessories.

U. S. Rubber Expanding

United States Rubber Co., 1230 Sixth Ave., New York, N. Y., has purchased the Hogansville plant of the Callaway Mills in Hogansville, Ga., according to H. Gordon Smith, general manager of the company's textile division. The company thus will be able to make substantially all its own duck for belting, hose, and other mechanical goods. The mills are adjacent to the company's tire cord mills, also were purchased from Callaway. The 400 workers, according to Mr. Smith will be retained, and others probably will be employed.

The company will also build a new factory for the exclusive manufacture of improved types of asbestos yarns and fabrics in Hogansville. Output of Asbeston, trade name for U. S. Rubber's asbestos textiles, was greatly increased last July when much new equipment was installed in the Stark Mills. The new expansion will double present capacity.

The U. S. Rubber Footwear Division this year will feature a line of athletic socks for use with athletic shoes for men, boys, and women.

Statement on Far Eastern Holdings

In the recently released annual report to stockholders appears the first official statement of U. S. Rubber relative to war losses. We quote:

"Approximately 21,000 acres of our plantations had been overrun by the invaders (in Malaya) but we have no word as yet as to any damage that may have occurred, although messages stated that all European and American employes were safe. The cash funds of Malayan American Plantations, Ltd., (subsidiary) of approximately $2,400,000 were located in Singapore banks, and $1,971,268 of these funds were transferred to London in January, 1942. The plantation properties in Sumatra, Netherland East Indies, had suffered no damage during 1941 and are continuing to operate in a limited manner."

The company's plantations consist of approximately 131,000 acres, of which 101,000 are in Sumatra and 30,000 acres in Malaya. There are 102,000 acres planted, and 88,000 acres mature. Production figures, based on reports for the full year from Sumatra and 10 months from Malaya, show that 57,000,000 pounds of rubber were shipped to the company or sold in 1941. This quantity, some 8,000,000 pounds less than for the full year of 1940, was about 15% of the company's requirements last year.

Domestic activities referred to in the report include the company's entrance into the munitions business, expansion of facilities for producing reclaimed rubber, and the construction of a large synthetic rubber plant for the government now in progress.

Personnel Mention

U. S. Rubber has granted J. E. Hutchman leave of absence to accept a position in the War Production Board in Washington. Dr. Hutchman for the past decade has been with Naugatuck Chemical Division of U. S. Rubber, and Dispersions Process, Inc., as divisional sales representative. All sales and development work formerly handled by Dr. Hutchman from his Indianapolis office will be transferred to the companies' New York offices. Dr. Hutchman is now principal industrial specialist of the Rubber, Cork, and Asbestos Section of Civilian Supply Division, WPB.

Fred H. Pinkerton, sales promotion manager of the U. S. Rubber mechanical goods division, is general chairman of the twentieth annual convention of the National Industrial Advertisers Association to be held in September in Atlantic City, N. J.

S. P. Thacher, manager, tire engineering and service department of U. S. Rubber at Detroit, Mich., believes tires and tubes can be stored for more than five years without suffering from deterioration if proper storage conditions are observed.

Cyrus S. Ching, director of industrial and public relations, addressed the New Brunswick (N. J.) Chamber of Commerce Lincoln Day dinner.

Solvents and Resins

Products of the Pennsylvania Industrial Chemical Corp., Clairton, Pa., of interest to rubber manufacturers include several types of reclaiming oil, Piccoumaron resins, and Piccolyte resins.[1] Type C reclaiming oil is a chemically balanced material of high solvency for reclaiming synthetic rubber. D-4, E-5, and C-10 are refined solvent naphthas for use in reclaiming natural rubber.

Piccoumaron resins of the XX series are designed for mixing with reclaimed rubber for taps, soles, heels, battery boxes, etc. The 430 series was developed for cheaper compounds such as hose and mats. Some types are useful with the butadiene synthetic rubbers; while others are employed in mechanical goods and druggists' sundries. The Piccolyte resins are used for extending latex and natural rubber, for tackifying, and in pale colored compounds.

[1] See also India Rubber World, Sept. 1, 1941, p. 55.

Martindell Molding Co., Trenton, N. J., is operating with two shifts six days a week in filling defense orders.

I. H. Albert, president of L. Albert & Son, Trenton, N. J., dealer in rubber machinery, who has been supervising operations at the Boston warehouse for the past three months, returned to the Los Angeles, Calif., branch, where he will remain several months.

The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y., held a board meeting on January 20 at which all directors were reelected except for Harry E. Smith, general manager of The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., who replaced F. L. Curtis, former general manager of the Manhattan Division, who had resigned from the R.M.A. board.

Geo. E. Pell, crude rubber broker, on February 13 moved to 15 William St., New York, N. Y.

Thiokol Corp., Trenton, N. J., is negotiating for the purchase of the former plant of the Murray Rubber Co. from the City of Trenton. The firm now occupies a portion of the plant with its main offices there, but has its product manufactured by the Dow Chemical Co. at Midland, Mich. A Thiokol official said that when the Murray plant is acquired, the company will begin the manufacture of specialties products. S. M. Martin is spending some time at the Dow plant developing new products of "Thiokol."

Mercer Rubber Co., Hamilton Square, N. J., operating 100% on government work, is now working 12 hours a day, seven days a week.

Dural Rubber Co., Flemington, N. J., according to President Robert J. Heiney, is installing equipment to reclaim rubber which will be in operation shortly. The company has ample stocks for its operations to date. The type of products turned out make it possible for Dural to manufacture without calling for large quantities of new rubber. The Flemington factory is now devoting a large part of its production to defense goods, and larger orders are anticipated. The company is now operating overtime.

The Thermoid Co., Trenton, N. J., as a health and safety measure, is distributing a bottle of milk to each employe at the "fatigue" point of various shifts, resulting in decreased accidents and improved stamina of workers. The plan was dramatized over NBC Red Network. Thermoid is using three shifts in several departments.

Slaughter, Horne & Co., 66 Beaver St., New York, N. Y., active in commodities for the past 13 years, has entered the securities trade with the election of Charles Slaughter to the New York Stock Exchange. Mr. Slaughter is a former president of The Rubber Exchange of New York, Inc., and of Commodity Exchange, Inc., of which he was an organizer.

Shell Union Oil Corp., 50 W. 50th St., New York, N. Y., in its annual financial report stated that the company is discussing with the government erection of a plant to produce thousands of tons of butadiene annually. This would be in addition to the plant completed in 1941 and now in production at the rate of several thousand tons a year.

Vulcanized Rubber Co., Morrisville, Pa., has appointed Treasurer Alfred O. Redland also vice president in charge of manufacturing. The company is operating to capacity on defense orders.

Hewitt Rubber Corp., Buffalo, N. Y., has announced the retirement of Boston Branch Manager Fred G. Phillips, after 36 years with the company. His successor is Andrew Thompson, formerly Hewitt's Northern New England representative.

Joseph Stokes Rubber Co., Trenton, N. J., is running to capacity at both the Trenton and Welland, Ont., Canada, plants, and the latter is reported unable to fill all the orders. The company is making some improvements and alterations at its Trenton factory.

Minor Rubber Co., Inc., 216 Market St., Newark, N. J., has purchased the building at 33-35 William St., to which it will transfer all its departments about March 15.

American Petroleum Institute, 50 W. 50th St., New York, N. Y., recently appointed the 1942 Committee on Marketing Equipment for the Division of Marketing. Among its personnel are C. E. Blair and W. A. Courtenay, Jr., both of Sun Oil Co., Philadelphia, Pa., and A. F. Larberg, Skelly Oil Co., Kansas City Mo. C. E. Townsend, of Sun Oil, has been named to the Division's 1942 Committee on Fire Prevention.

Society of Automotive Engineers, Inc., 29 W. 39th St., New York, N. Y., has opened a West Coast branch office at 530 W. Sixth St., Los Angeles, Calif. E. F. Lowe, SAE assistant general manager, is in charge.

LEGAL

Carbon Black Ruling Amplified

Last month we announced that the Fourth United States Court of Appeals reversed a previous lower court ruling on a patent infringement suit brought by Binney & Smith Co. against United Carbon Co. The higher court held that the patent in suit is valid and is infringed by the defendant's product. The patent involved is No. 1,889,429, granted November 29, 1932, to W. B. Wiegand and L. J. Venuto, and assigned to Binney & Smith Co. Only the claims relating to the pelleted product were involved.

We now quote the following excerpts from the court's decision, which space did not permit us to use last month.

"We think that the evidence shows conclusively that the patentees under the patent in suit were the first to solve the problem presented by the dust nuisance arising from the use of carbon black in the manufacture of rubber tires for motor vehicles. . . . Efforts to produce carbon black in a form which would eliminate the dust nuisance engaged the attention of a number of the best minds connected with the rubber industry, but until the issuance of the patent in suit these efforts were unavailing. A large number of patents were applied for and issued, but none covered a product which would meet the demands of the industry. . . .

"The invention of plaintiff's patent consisted in producing carbon black in the form of small rounded pellets, which were dustless and which would disintegrate into the original small particles of carbon black when subjected to the pressure involved in the rubber manufacturing process. These pellets could be easily handled and could be transported in tank cars or stored in bulk instead of being shipped in paper bags, as required in the case of carbon black powder. . . .

"Claims one and two of the patent, being the product claims here relied on, are as follows:

"'1. Substantially pure carbon black in the form of commercially uniform, comparatively small, rounded, smooth aggregates having a spongy porous interior.

"'2. As an article of manufacture, a pellet of approximately one-sixteenth of an inch in diameter and formed of a porous mass of substantially pure carbon black.'

". . . . It will be observed that the process of plaintiff's patent prescribes churning or agitation of the mass of carbon black and liquids. This churning or agitation is evidently the really important thing in the process, and when properly carried on, is what causes the carbon black to agglomerate into pellets, and to do so whether any liquid is present or not. . . .

". . . . The patentees had made a substantial contribution to an important art by solving a problem which had baffled other technological experts who had addressed themselves to it. They described their product in terms by which any one could identify it; and they set forth a process by which it could be manufactured. Theirs was a pioneer patent as applied to the particular art; and its claims are entitled to a liberal construction. . . ."

The Supreme Tire & Rubber Co., Philadelphia, Pa., in a recent Customs Court decision, was overruled in a protest claiming free entry for used automobile tires from England as scrap or refuse india rubber fit only for remanufacture. But according to paragraph 1697 of the tariff the term applies only to articles that have lost commercial use and value; consequently the 10% duty as provided for automobile tires held in this case.

OHIO

Seiberling Changes

Seiberling Rubber Co., Akron, last month announced, through Vice President H. P. Schrank in charge of production, several personnel changes. Chief Chemist Ralph LaPorte was made manager of production of the company's expanded mechanical goods department and will be responsible for the development and production of all items made by Seiberling except tires and tubes. A. A. Leedy continues as production superintendent of the tire division. Other appointments in the expansion include: Fred Immler, in charge of design and construction development; A. H. Lietzow, in charge of cost estimating and scheduling and sales office. Wm. J. Ruscoe continues as mechanical goods sales manager. Mr. LaPorte joined Seiberling in 1924 as assistant in the laboratory and became chief chemist in 1933.

Placing new emphasis on government sales, a reorganization of the Seiberling sales department, to "streamline and clearly outline" sales responsibilities, was announced by J. L. Cochrun, vice president in charge of sales.

Named to the new position of assistant sales manager in charge of government and manufacturers' sales was L. M. Seiberling, commercial sales manager, who has been with the company since 1927, specializing in commercial and mileage accounts. His successor is T. M. Hughes.

C. A. Reed, assistant general sales manager, continues as such. The shift of duties will permit him to give more attention to the problems of dealer assistance during the war.

Head of mechanical goods sales is William J. Ruscoe, who will report to Colonel Cochrun. In line with the increased importance of tire service, G. A. Wiedemer was made service sales manager.

A Washington, D. C., sales office was opened at 1147 Connecticut Ave., to aid in making direct contacts on government business. J. F. Seiberling is in charge.

Simplification for Conservation

To conserve vital supplies of crude rubber The B. F. Goodrich Co., Akron, on January 29 announced further plans for far-reaching simplification of its industrial and mechanical rubber goods. In a letter to dealers and distributers the company stated that it would, wherever possible, substitute reclaimed rubber for crude in commercial industrial products. Besides some products, as certain high-quality conveyer belts, transmission belts, and various hose as garden, radiator, and air, have been discontinued, and substitutes suggested. Thus in many instances deluxe or "super longlife" products are no longer made, but standard materials are offered instead. Although Goodrich does not plan to eliminate crude rubber from a product where it is essential to the general economy of industrial production, the company will reduce the life factor of some goods without sacrificing efficiency during this period of national emergency.

Organization Changes

The former mechanical goods and sundries sales divisions at Goodrich have been combined and named the Industrial Products Sales Division, according to W. S. Richardson, division general manager. The organization set-up under the new policy follows: B. F. Stauffer, division assistant general manager in charge of Miller plant activities; L. H. Chenoweth, manager, manufacturers' sales; C. F. Conner, manager, distributer sales; C. O. Delong, manager, operations; and the following department managers: P. W. Van Orden, hose and belting; J. F. Johnston, molded, extruded, sponge, Anode dipped goods; G. K. Ryan, rubber and latex thread, golf ball products; H. C. Klein, rubber lined and covered equipment; F. A. Lang, shoe products sales; J. M. Failey, printing rubber, rolls, and blankets, platens, packings, floor coverings, lathe cut goods; H. A. Bauman, bands, drug, hospital, and surgical products.

Elmer T. Campbell, with Goodrich and affiliated companies since 1921 and recently in New York as a special representative of the company's petroleum sales department, has been transferred to the Washington, D. C., offices of the company's national sales and service division, according to G. E. Brunner, division general manager.

The General Tire & Rubber Co., Akron, has appointed Thomas C. Mundy as district manager in the south, according to L. A. McQueen, vice president in charge of sales. Mr. Mundy, a native of Birmingham, Ala., with headquarters in Dallas, Tex., entered the rubber industry with the Ajax Rubber Co. as a salesman in the Southeast. He joined General as a salesman out of the Memphis office in 1932 and in April, 1940, was made district manager of the Memphis area.

General Tire on February 3 held its annual stockholders' meeting at which President William O'Neil and all other officers were reelected.

The Firestone Tire & Rubber Co.'s dealers and stores, as part of the company's new free Extra Mileage Plan, are branding the initials of motorists on the sidewalls of their tires as protection against theft.

The Timken Roller Bearing Co., Canton, has announced the retirement of Peter Voss, after 24 years with the company. He first was a clerk in the purchasing department, became purchasing agent in 1923 and in 1934, director of purchases.

Goodyear Report

The Goodyear Tire & Rubber Co., Akron, held a directors' meeting early last month at which Robert E. Wood, chairman of Sears, Roebuck & Co., and Howard L. Hyde, Goodyear's general counsel, were elected to the board to succeed the late George A. Tomlinson and Henry B. Manton.

In the annual report to stockholders the company lists a total net foreign investment of $40,430,000, distributed as follows: Argentina, $3,799,000; Australia, $3,897,000; Brazil, $3,597,000; Canada, $6,482,000; Great Britain, $4,541,000; India, $529,000; Netherlands India, $12,029,000; Philippines, $1,252,000; South Africa, $1,140,000; Sweden, $1,179,000; other foreign, $1,985,000.

Goodyear's Buitenzorg, Java, factory, opened in 1935, recently built Tire No. 1,000,000. The plant now is busy mostly with defense orders.

Plans for complete conversion of Goodyear's big, new tire plant at Jackson, Mich., into a cannon factory were announced February 11. The company made these facilities available to the Ordnance Department on its own initiative.

H. L. Riddle, assistant comptroller of Goodyear Foreign Operations and manager of the comptroller's foreign department, has been made assistant treasurer of Goodyear Aircraft Corp.

Goodyear recently reported the use of another of its rubber products by The Douglas Aircraft Corp., Santa Monica, Calif. Fuselage of the new Douglas 40-passenger transport plane during building is supported in its jig, both fore and aft, by a specially constructed cradle, using a 20-inch wide transmission belt as a sling. For some of the smaller planes a 10-inch belt is being utilized.

Paul W. Litchfield, chairman of the board at Goodyear, recently advised motorists to go easy on curves if they wish to get extra mileage from their tires. Analysis of sweepings by the company from 80 curves in 35 miles revealed that tire wear on curves is 1200% greater than on the straightaway. Goodyear research men have estimated that the average tire on a new car will give about 30,000 miles of service if driven at 35 miles an hour, but only 20,100 miles if the average speed is 50 miles an hour. Mr. Litchfield further declared that with 110 million tires and tubes in present use in America, if each driver reduced his average speed 10 miles an hour, he would get about 6,300 extra miles out of his tires, and the sum total for all motorists in the nation would be about seven billion extra tire miles.

The Pioneer Rubber Co., Willard, has developed a glove, known as Dawn, made of old inner tubes. The company last March voluntarily discontinued Ebonettes, neoprene household gloves, to conserve synthetic rubber for defense purposes.

CANADA

To Manufacture Synthetic Rubber

C. D. Howe, Minister of Munitions and Supply, stated that the Canadian Government has decided to manufacture synthetic rubber from petroleum. The base plant will be at the Dominion end of a pipeline carrying petroleum to Canada from the United States wells. The synthetic rubber process to be used is the buna, which uses by-products from oil refining as raw material.

Work on the plant will start as soon as possible, and it is expected to be in production in about 15 months. There are three stages in the process of making rubber from petroleum, and it had not yet been decided whether the two subsequent processes will also be done in this new plant. It is possible that one or more of the plants will be in Alberta as the production of crude petroleum and natural gas in that province provides an excellent start for making synthetic rubber. Manufacture of synthetic rubber will for the most part be undertaken in large central establishments which will draw from an extensive surrounding territory.

The basic or first operation will require a "very large plant", but the Minister did not say what the cost would be although other sources estimated plants for the three processes at $40,000,000.

On the basis of recent official announcement that it would cost about $1,500,000 for a plant adequate to produce 1,000 tons of synthetic rubber, it would appear that capacity of the proposed Canadian plant is to be about 25,000 tons yearly.

Rulings on Tires

An order governing the sale of used and retreaded tires and tubes was issued by the Supplies Controller on February 11, providing that such tires and tubes may be sold only at prices equivalent to those charged during the basic period, September 15, 1941, to October 11, 1941, and in no case at more than 75% of the published retail price for new tire, tube, or casing of the same size, brand, and grade. The ruling further requires that each purchaser must turn in to the dealer a tire or tube of corresponding size, removed at the time of the sale from the rim of a running wheel or spare, before buying a used, repaired, retreaded, or recapped tire or tube. No trade-in allowance, however, will be granted. After the purchase an owner must not have more tires than are necessary to equip his running wheels and one spare.

Also, except under permit from the Controller, no tire repairer may charge more for repairing, recapping, or retreading a tire or repairing a tube than he charged for such work during the above-mentioned basic period.

As manufacturers had been forbidden to equip new automobiles with spare tires, special provision is made in the new order enabling the new-car owner to buy a used, recapped, or retreaded tire and a used tube if he has no spare. New tires cannot be purchased in this way.

If a tire or tube is stolen, the owner must apply to the nearest local prices and supply representative of the Wartime Prices and Trade Board for a certificate, which must be presented to the tire dealer when the owner goes to buy another tire or tube. If the vehicle qualified only for used tires before the theft, it would qualify only for a used tire for replacement.

The order defines a "used" tire as one that has been on a "running wheel for 300 miles or more."

Eligible purchasers of new automobile tires must sign a consumer order form embodying a witnessed declaration that the tires to be purchased will be no more than enough to equip the buyer's automobile, Supplies Controller Alan H. Williamson has ruled. Tires now stored in attics, basements, and private garages must be used to the last mile before additional tires can be purchased.

Provisions for replacing stolen automobile tires through an extension of the government order regulating the sale of new tires, casings, and tubes were outlined by the Department of Munitions and Supply. Under the extended regulations ordinary consumers forbidden by the order to purchase new tires except five off-sizes and bicycle tires may, if insured, replace stolen tires through an arrangement with the insurance company by proving the theft. Eligible new tire buyers may, if insured, replace stolen tires through the same arrangement even if the stolen tire was new. Persons not insured have no redress in case of theft.

Also to prevent thefts the Department has made it an offense subject to punishment for anyone to buy or sell, without special permission, a tire from which the serial number has been removed.

P. H. Boivin, head of the elastics and narrow fabrics division of the Wartime Prices and Trade Board, following recent meetings to study conservation of rubber by restrictions on division products, announced last month that women's bathing suits and shoes no longer will contain any rubber; men's suspenders will have only a small piece of rubber at the back; rubber use in corsets will be reduced at least 50% with the rubber confined to panel strips; rubber content of women's underwear and other garments will be cut at least 60%; in fact in no case will wearing apparel be made containing more than one-half the rubber formerly used.

J. C. Howard, chemist, Kaufman Rubber Co., Ltd., Kitchener, Ont., on February 3 addressed the K-W. Kiwanis Club, Kitchener, on synthetic rubbers.

Goodyear Safety Meeting

Every available pound of rubber must be conserved to offset the loss of many of Canada's supply sources in the Far East, R. C. Berkinshaw, chairman of the Wartime Industrial Control Board, told several hundred employes of the Goodyear Tire & Rubber Co. at a recent safety rally in the company's New Toronto, Ont., plant.

"Steps are being taken to produce synthetic rubber in Canada, but this process will involve very heavy capital expenditures," said Mr. Berkinshaw. "It will cost about one and a half million dollars to produce each 1,000 tons of rubber. Much can be done with reclaimed rubber, and this process will be utilized also. It is absolutely necessary, however, that not a scrap of rubber be wasted. We will have to face the fact that many articles formerly produced will be cut down or abolished altogether."

The meeting was also addressed by K. Barton, who left Toronto five years ago to establish mechanical goods production in the British Goodyear plant at Wolverhampton. He said the plant, well protected, had not been damaged in any way, despite the fact that German bombers passed over the area every day and night during the blitz period.

A. W. Denny, plant superintendent, introduced E. H. Koken, vice president in charge of production, who presented two awards of merit for exceptional safety services to E. Yearsley and M. R. Brand. In addition banners were presented to the heads of departments in which no lost-time accidents occurred over a period of not less than five years.

Henrique Pinheiro de Vasconcellos, consul-general of Brazil at Montreal, P. Q., believes the wild rubber trees of his native land are the answer to the rubber shortage confronting the United Nations. Peak production was reached in Brazil in 1912 at 42,410 tons. After a careful survey Brazilian authorities are confident that this high output can again be reached in one year's time because the entire Amazon Valley teems with millions of rubber trees and it is not necessary to spend years building up plantations. The difficulties and dangers of gathering the wild rubber in the jungles have not been overlooked. It is pointed out, however, that they were overcome or surmounted to a great extent at the start of the present century and that this can be certainly done again. With cost now no object, these difficulties and dangers are now the only factors controlling the extent to which Brazil's wild rubber trees can be exploited.

Information reaching the offices of the Brazilian Consulate-General in Montreal tells of a "tremendous burst of activity" in the rubber area of Amazonas. With the current universal interest in rubber mounting almost daily, hundreds of workers are leaving other employment in Brazil to tap the wild rubber trees of the Amazon jungle.

OBITUARY

William J. Tompkins

A LUNG tumor caused the death, on January 25, 1942, at his home in Mt. Vernon, N. Y., of William J. Tompkins, president of the American Rubber Products Corp., 151 E. 50th St., New York, N. Y. Mr. Tompkins, who was born December 29, 1889, at St. Paul, Minn., and educated at Fort Wayne, Ind., schools and Purdue University, became a salesman for the United States Rubber Co. in 1912. Then in 1918 he went to the Tee Pee Rubber Co., Buffalo, N. Y., and was made vice president and manager. Early in 1927, however, the deceased, with two other men, secured control of the Voorhees Rubber Mfg. Co. and the American Rubber Products Corp., both of Jersey City, N. J. Mr. Tompkins was named vice president and a director at Voorhees and assistant general manager and a director at American Rubber Products. Later in the year the two firms combined, and eventually Mr. Tompkins was elected president.

Requiem mass was said at the Sacred Heart Church, Mt. Vernon, on January 28. Burial occurred in Woodland Cemetery, Stamford, Conn.

Survivors include the widow, two daughters, six brothers and sisters.

Olin J. Garlock

OLIN JAMES GARLOCK, founder of the Garlock Packing Co., Palmyra, N. Y., died from pneumonia January 31 at the Palmyra residence. He was born July 5, 1861, at Phelps, N. Y., and moved with his parents to Palmyra 13 years later.

While working as a steam engineer in Palmyra, he realized the value in industry of good packings and in 1889 established a factory for their production. The Garlock Co. was incorporated in 1905. In 1929, he severed his connection with the Garlock company and a short time later became associated with the Crandall Packing Co., with which he continued until 1938.

Funeral services and burial were at Palmyra, February 2.

Two sons and a sister survive.

Arthur A. Spencer

ON JANUARY 13, Arthur Anthony Spencer, who when he retired in 1929 after 39 years with the Woonsocket Rubber Co., Woonsocket, R. I., had been assistant treasurer, died of diabetes and complications at his home in Oaklawn, R. I. Born in Natick, R. I., May 13, 1874, Mr. Spencer attended the local school and Bryant Stratton Business College. He was also a Mason.

Funeral services were held on January 16 at West Warwick, R. I., with interment in Apponaug, R. I.

Mr. Spencer is survived by his wife, a daughter, and a grandson.

FROM OUR COLUMNS

50 Years Ago—March, 1892

The best preservative of rubber in this climate is its proper vulcanization. If an error is made in this regard, rubber goods will not last long. (p. 159)

We think the very best rubber which in the present state of knowledge it is possible to manufacture is what is known as "antimony rubber" consisting of good pure gum and a proper proportion of what is known as sulphuret of antimony. (p. 168)

Hard rubber balls for use in bowling alleys are little known but have been used with good success. The surface is of hard rubber with combination filling. They are expensive. (p. 184)

25 Years Ago—March, 1917

The solvent which finds the most extensive application in the rubber industry is gasolene. (p. 317)

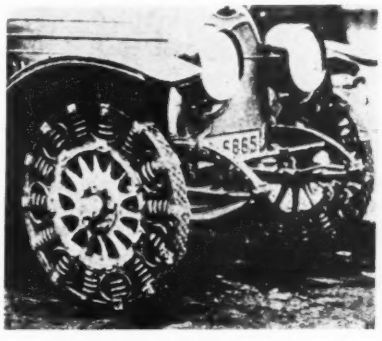
Hard sponge has considerable strength, and has been proposed as a material for the framework of aeroplanes. It has also been recommended as a material for constructing automobile bodies. (p. 323)

Some shoe finders have been purchasing scrap rubber belting and cutting it into half soles to sell to shoe repairers, who find that such soles wear admirably, especially in mining districts. (p. 324)

It was observed that the nitrogen content of sheet and crepe is about twice as great as that of coagulum left unpressed for a period of six weeks and then washed and creped. (p. 325)

Our land-grant colleges should offer special instruction in tropical agriculture and make rubber culture a requirement. The Americas have the soil as well as the conditions, and though handicapped by the cheap labor of the Orient, American methods, aided by American machinery, will be successful. Another matter not entirely devoid of interest is the possibility, though remote, of the production of crude rubber in the Temperate Zone. (p. 341)

A close examination of the 109 patents, and almost as many foreign ones, covering "processes for restoring old rubber" indicates that it would be difficult to work out an original idea on the subject. (p. 341)



Spring Wheel on German Auto (P. 359)

Morgan W. Jopling

MORGAN WHITE JOPLING, chairman of the board of the New York Rubber Corp., 9 Rockefeller Plaza, New York, N. Y., died February 3 at Port Jefferson, L. I., following submersion and exposure while he was on coast patrol duty.

He was born in Marquette, Mich., in 1884. He attended St. Marks School in Southboro, Mass., was graduated from Harvard University in 1906, and later studied at the Michigan School of Mines. During the World War he was associated with the War Trades Bureau and served as a lieutenant in the army in Siberia.

Mr. Jopling was also president of Harrison White, Inc.; Griplock, Inc., and Delft Theatres, Inc.; chairman of MacArthur Concrete Pile Corp.; vice president of the Beebe Mfg. Co.; treasurer of St. Johnland Home; a director of Williams A. Saylor, Inc.; and a member of the Century Association and the Harvard Club.

Funeral services and interment took place February 5 at St. James, L. I.

A son and two daughters survive.

Arthur A. Flanagan

ARTHUR A. FLANAGAN, factory manager of the St. Laurent, P. Q., Canada, plant of the British Rubber Co., died January 10. Born in 1891 at Granby, P. Q., he was the son of the late Anthony Flanagan, a pioneer in the Canadian rubber industry.

The deceased began his association with the rubber industry at an early age and was employed by the Dominion Rubber Co. prior to joining the British Rubber Co.

The funeral service was held at St. Augustine Church, Montreal, and burial was at Granby.

A wife, a son, a daughter, a brother, and four sisters survive.

Ellen Maria Hotchkiss Goodyear, widow of the late Dr. Robert Goodyear, died at her home in North Haven, Conn., on February 8 in her ninety-fifth year. Mrs. Goodyear's mother had been a first cousin of Charles Goodyear, and the deceased, when a child, knew him well. She had, at her death, many articles and rubber jewelry made by the inventor.

FAR EAST

NETHERLANDS INDIA

Latex Paper vs. Pliolite Paper

Pliolite-treated writing paper is far superior in durability and resistance to weathering than similar latex-treated paper and can be used both for field work and for records, J. W. Zaaier[1] found when he compared the durability of Pliolite paper with paper rendered waterproof with latex by a method developed by C. E. van Gils.[2] Written samples of both kinds of papers were (a) exposed to sun and rain; (b) exposed to rain and diffuse daylight; (c) exposed to diffuse daylight only; (d) folded over a few times and left out on a desk. The latex-treated started by being inferior to the Pliolite paper in two respects: it was poorer in color and unduly thick.

The results obtained with the latex paper were: Samples (a) were almost completely consumed after four weeks, chiefly because of the rapid resinification of the protective rubber coating; only a few loose pieces remained, streaked and mostly dark brown in color, and the writing on them was illegible. In samples (b) resinification had not progressed so far after four weeks, and results were somewhat better; the writing was still legible. Samples (c) were again a little better than (b), but after six weeks were dark brown, and when folded and pressed together, it was difficult to separate the parts again. Samples (d) began to show signs of tackiness at the edges after six weeks. These samples were kept under observation for a few months longer, when it seemed that the paper had lost most of its firmness, as though it had absorbed water in that moist climate.

On the other hand Pliolite-treated samples (a) and (b) did not begin to show signs of deterioration until after three months had passed—there was no resinification, and the color, which to start with was a much better white than that of the latex paper, was hardly affected; writing was legible. Samples (c) and (d) have remained practically unchanged up to the time of writing, which was nine months after the tests were begun.

[1] "Waterproof Paper." J. W. Zaaier, *Bergcultures*, Nov. 1, 1941, p. 1504.
[2] "Waterproofed Writing Paper." INDIA RUBBER WORLD, Jan. 1, 1941, pp. 27-28.

Organic Analysis of Latex

The organic compounds present in latex are so considerable in number and so varied in composition that a complete analysis of this extremely complex mixture seems almost impossible. However complete insight into the chemical composition of latex is so important that a study of this difficult problem in analysis deserves the fullest attention, says R. F. A. Altman[3] in presenting the scheme he has developed for general analysis of *Hevea* and which he proposes to work out systematically, step by step. He had in mind an ideal analysis which would be as reliable as it was complete, where all constituents would be quantitatively separated and in the original state in which they were present in the latex. For this purpose it was clear that only fresh, unammoniated latex could be considered as *the* reliable, starting material. On an estate this was no trouble. But the analysis presented various difficulties due chiefly to (1) the fact that the rubber hydrocarbons adsorb and keep tenacious hold on the other later constituents; (2) chemical, enzymic, and bacterial changes which may occur and cause great difficulties in the isolation of the constituents in the original state in which they are present in latex; and (3) the lack of proved methods of quantitative separation of the various groups of the organic compounds.

For these reasons the author found himself constrained to compromise to some extent in the attempt to develop an ideal method of analysis since for the present, at least, it has not been found possible to separate all the latex constituents quantitatively and in their original state. As a result of various theoretical considerations and practical experience gained in the meantime, he was able to work out the method of analysis demonstrated below:

SCHEME OF THE METHOD ADOPTED FOR THE ANALYSIS OF *HEVEA* LATEX

FRESH LATEX (1 liter)
dropping into 9 liters alcohol 96%
COAGULATED RUBBER
creping without washing
rolling in filterpaper
ALCOHOLIC SOLUTION
filtering
FILTRATE
PRECIPITATE
(contains proteins)
boiling the rubber for 3 hours in ½ of filtrate with CaCO3; repeating extraction:
1) twice with the rest of the filtrate:
2) three times with fresh alcohol; decanting and filtering
EXTRACTED RUBBER
boiling 3 times with 2.5 liter water for ½ hour; decanting
YELLOW ALCOHOLIC EXTRACT
distilling in vacuo in CO atmosphere; extracting the residue with ether
PRECIPITATE
(contains calcium carbonate and phosphate)
AQUEOUS SOLUTION
WATER—LAYER
COMBINING
EXTRACTED RUBBER
dissolving according to Midgley, Henne and Renoll[2]
AQUEOUS EXTRACT
analyzing qualitatively according to the lead precipitate method; afterward separating the various groups of organic compounds found present in the mixture, e.g.
ETHER EXTRACT
dividing in three parts for the estimation of:
a) acid-number, saponification number, N and P content;
b) lecithin, cephaline, and fat content;
c) saponification products, e.g.:
PROTEINS
AMINO-ACIDS[3]
AMINES, BETAINES[3]
AMIDES
SUGARS
QUEBRACHITOL, ETC.
FATTY ACIDS
RESIN ACIDS
STEROLS
WAX-ALCOHOLS
CAROTINES, ETC.

[1] "Organic Analysis of *Hevea* Latex. VIII. Development of a General Scheme of Analysis." R. F. A. Altman, *Arch. Rubbercultuur*, Nov. 6, 1941, pp. 423-33.
[2] T. Midgley, A. L. Henne, M. W. Renoll, *J. Am. Chem. Soc.*, 59, 2501 (1937); compare also G. R. Tristram, *Biochem. J.*, 35, 413 (1941).
[3] R. F. A. Altman, *Arch. Rubbercultuur*, 24, 647 (1940); 25, 1 (1941).

EUROPE

U. S. S. R.

Properties of Compounds with *Kok-Sagyz* Rubber

The effect of various fillers, including Russian blacks, on the properties of *Kok-sagyz* rubber alone or mixed with Russian synthetic butadiene rubber (S.K.) was studied by Fabritziev and Vishnevskaya and compared with results for pale crepe and smoked sheet, also alone or mixed with S.K.

The basic formulas used were:

TABLE 1

	Unloaded Mixes for Investigating Effects of Kaolin and Whiting	Control Mixes for Investigating Effects of	
		Blacks	Softeners
Rubber	100	100	100
Zinc oxide	5	5	10
Stearic acid	1.5	3	..
Sulphur	3	3.5	3.5
Captax	1	1	1
D.P.G.	..	..	..
Maikop black	..	..	40

Tests on Unloaded Mixes

Smoked sheet and pale crepe used in the control mixes were first plasticized for 12 minutes to a softness of 3.50 (Williams), but *Kok-sagyz* rubber required no preliminary plasticization. The S.K. used has a plasticity of 0.6 and an alkalinity of 1.43%. Unloaded *Kok-sagyz* mixes proved somewhat inferior to smoked sheet and pale crepe as regards mechanical strength; permanent elongation was higher, and resistance to aging was lower. On the other hand, the former vulcanized more rapidly. The addition of S.K. in the proportion of 50%:50% to the various rubbers, resulted in interesting changes in their properties. Thus all combinations reached optimum cure more rapidly than 100% natural imported rubber; mechanical strength and elongation at break were adversely affected in all cases, but these values for the *Kok-sagyz* plus S.K. mixes were superior to those for similar mixes of imported rubber plus S.K. *Kok-sagyz* alone or combined with S.K. was rather more inclined to scorch than pale crepe or smoked sheet, and this tendency was particularly marked when the S.K. content was raised, there being then a proportionate increase in scorching while at the same time tensile values tended to decline. The resistance to aging of *Kok-sagyz* did not appear to be improved by the addition of S.K.

DON'T SCORCH RUBBER

IT is not only uneconomical, it is downright unpatriotic to ruin precious rubber today. With the activity of modern accelerators it is most important to check temperatures with dependable instruments at every step in manufacture. We suggest Cambridge Pyrometers. They are accurate, rugged, dependable instruments built to meet the needs of the rubber industry.

CAMBRIDGE INSTRUMENT CO., INC.
3732 GRAND CENTRAL TERMINAL, NEW YORK, N. Y.

The surface model is for checking temperatures of still and moving rolls, the needle for inserting in plastic masses, the mold for reaching into mold cavities. Send for particulars.

CAMBRIDGE
SURFACE • NEEDLE • MOLD
PYROMETERS

NAFTOLEN* R100

the *true*

EXTENDER

for

CRUDE RUBBER,

RECLAIM

and

SYNTHETICS

W
C=C

Wilmington Chemical Corporation

Wilmington, Delaware

*Reg. U. S. Patent Office

On the whole the mechanical properties of unloaded *Kok-sagyz* mixes seemed to resemble those of pale crepe more nearly than of smoked sheet.

Kok-Sagyz Rubber Reenforced with Soviet Blacks

Tests were conducted on the mixes in formula (2) in Table 1, with the addition of 20, 30, and 40 parts (volume) of the locally produced Maikop or Kudinov blacks. The compounding program followed was: heating rubber, three minutes; adding softener, 3.5 minutes; adding accelerator, 1.5 minutes; adding filler, ten minutes; adding sulphur, five minutes—in all 23 minutes. The imported rubber used in the control mixes was first plasticized for nine minutes. *Kok-sagyz* required no preliminary plasticization, and it proved easier to incorporate the blacks with this rubber than with the imported rubber.

As Table 2 shows, tensile strength and abrasion figures of *Kok-sagyz* mixes were inferior to those of imported rubbers, but as in the case of the unloaded mixes, the addition of S.K. in the proportion of 50%:50%, while causing general deterioration of properties, proved in some respects to have a less adverse affect on *Kok-sagyz* mixes than on those of imported rubber; for instance, aging resistance was better. The Kudinov black yielded much softer compounds than did the Maikop black; in general the latter was found to give much better results and was considered a much more suitable filler for *Kok-sagyz* rubber; the proportions recommended were 20 volume parts of Maikop black to 100 weight parts of *Kok-sagyz* rubber.

Kok-Sagyz Compounded with Whiting and Kaolin

Whiting and kaolin were added to basic formula (1) (Table

Table 2. Effect of Maikop and Kudinov Blacks

	Volume Parts of Blacks	Plasticity of Mixes, h_2	Optimum Cure in Minutes	Tensile Strength Kg./Cm.²	Elongation at Break in %	Permanent Set in %	Modulus Kg./Cm.² at 300%	Modulus Kg./Cm.² at 500%	Aging Coefficient 10 Days	Jones Hardness	Abrasion Grasselli CC./H.P. Hr.
Smoked sheet											
Maikop black	30	3.47	30	251	582	34	106	214	0.66	0.61	261
Kudinov black	30	2.24	20	176	552	20	100	...	0.60	0.73	291
Pale crepe											
Maikop black	30	3.60	30	256	584	42	114	223	0.63	0.60	267
Kudinov black	30	2.27	20	163	500	24	96	163	0.78	0.81	284
Kok-sagyz											
Maikop black	20	2.32	20	183	618	40	62	139	0.57	0.92	477
Maikop black	30	3.44	20	161	500	40	91	161	0.67	0.65	307
Maikop black	40	5.33	20	143	400	32	119	...	0.43	0.37	296
Kudinov black	20	1.87	20	132	572	34	56	116	0.69	0.99	441
Kudinov black	30	2.27	20	104	400	30	75	...	0.62	0.64	480
Kudinov black	40	3.51	20	96	330	20	89	...	0.60	0.46	460
Smoked sheet + S.K. (50%:50%)											
Maikop black	30	3.41	20	166	670	49	80	142	0.4	0.45	198
Pale crepe + S.K. (50%:50%)											
Maikop black	30	3.46	20	171	686	50	85	...	0.4	0.51	222
Kok-sagyz + S.K. (50%:50%)											
Maikop black	30	3.20	10	140	485	47	28	54	0.52	0.89	377

Table 3. Effect of Kaolin and Whiting

Vulcanization in the Press at 142° C.	Volume Parts Fillers	Plasticity of Mixes, h_2	Optimum Cure in Minutes	Tensile Strength Kg./Cm.²	Elongation at Break, %	Permanent Set, %	Tensile Product	Aging Coefficient 10 Days
Smoked sheet								
Mixes with kaolin	20	2.55	40	208	560	41	1,178	0.9
Whiting	20	2.25	30	199	663	20	1,332	0.71
Pale crepe								
Mixes with kaolin	20	2.43	40	203	580	44	1,235	0.89
Whiting	20	2.36	30	180	724	26	1,295	0.86
Kok-sagyz								
Mixes with kaolin	20	2.29	20	142	690	30	960	0.84
	30	2.81	20	124	570	63	706	0.73
	40	2.35	20	102	460	61	460	0.76
	50	2.46	20	102	500	60	510	0.70
Mixes with whiting	20	1.88	20	129	786	34	1,010	....
	30	1.87	20	101	699	39	710	....
	40	1.90	20	98	693	49	675	....
	50	1.92	20	73	683	48	478	....
Kok-sagyz + S.K. (50%:50%)								
Mixes with kaolin	20	2.50	10	104	817	68	854	0.80
	50	2.79	10	77	534	69	432	0.60
Whiting	20	2.01	10	90	832	41	747	....
	50	2.23	10	62	727	62	448	....

Table 4. Effect of Various Softeners

	Parts by Weight	Plasticity h_2	Scorching	Optimum Cure in Minutes	Tensile Kg./Cm.²	Elongation at Break %	Permanent Set	Modulus Kg./Cm.² at 300%	Modulus Kg./Cm.² at 500%	Jones Hardness	Abrasion CC./H.P. Hr.	Aging Coefficient 10 Days
Kok-sagyz												
Control, no softener	..	3.21	0.78	50	92	500	40	62	...	0.70	450	0.27
Stearic acid	3	3.04	0.55	30	175	580	36	74	155	0.44	333	0.50
	5	2.90	0.57	30	237	600	34	74	163	0.37	315	0.50
	7	2.68	0.70	20	198	630	38	58	125	0.35	...	...
Batkak	3	2.64	1.30	20	167	640	38	68	...	0.50	335	0.42
	5	2.55	1.00	20	195	632	39	50	113	0.44	425	0.30
Pine tar	3	3.00	0.50	50	107	580	35	48	96	...	420	0.40
	5	2.90	0.40	40	133	620	36	59	115	0.43	410	0.85
Mineral rubber	3	2.90	0.40	50	113	588	38	52	104	0.84	420	0.80
	10	2.40	0.40	50	70	600	60	30	60	1.10	502	0.45
Machine oil	3	3.15	0.65	40	99	500	40	59	...	0.60	354	0.39
	5	3.02	0.70	40	94	500	40	52	...	0.52	405	0.35
Kok-sagyz + S.K. (50%:50%)												
Stearic acid	3	4.20	0.58	20	165	680	50	59	113	0.50	245	0.55
	5	3.95	0.35	20	160	808	70	36	70	0.44	...	0.57
Batkak	3	3.70	1.20	20	164	636	68	30	103	0.45	360	0.50
	5	3.45	1.50	20	182	820	70	38	80	0.42	...	0.50
Pine tar	3	3.74	1.68	30	151	600	58	60	116	0.42	317	0.50
	5	3.62	1.00	30	163	780	58	..	85	0.55	235	0.57
Mineral rubber	3	3.65	0.80	30	164	648	60	63	114	0.60	293	0.30
Stearic acid + mineral rubber	2.5 + 2.5	3.75	0.72	20	179	800	74	41	81	0.43	458	...
Batkak + mineral rubber	2.5 + 2.5	3.60	1.45	20	175	780	72	43	85	0.50	...	...
Batkak + pine tar	2.5 + 2.5	3.48	1.09	20	165	820	60	42	82	0.54	...	...
Control, no softener	..	3.80	0.79	30	109	556	45	47	97	0.67	461	...

1) in the proportions of 20, 30, 40, and 50 volumes parts per 100 weight parts of rubber. Results, as shown in Table 3, indicated that kaolin was better suited for *Kok-sagyz* rubber than whiting, for although inclusion of kaolin led to much higher permanent set figures, its effect on aging resistance and tensile was more favorable. However, as in the other tests, *Kok-sagyz* mixes were definitely inferior to comparable imported rubber mixes. An increase in whiting and kaolin content caused a proportionate decrease in mechanical strength of the vulcanizates, but the rate of cure remained unaffected regardless of the proportion of fillers used. Kaolin also gave better results than whiting in mixes of *Kok-sagyz* plus S.K. (50%:50%)

Tests with Various Softeners

In these tests only *Kok-sagyz* and combinations of *Kok-sagyz* and S.K. were used; mixes were based on formula (3) (Table 1). The softeners employed were stearic acid, batkak (residue of technical cod-liver oil), pine tar, rubrax (mineral rubber), and machine oil, in the proportions of three to ten weight parts per 100 weight parts of rubber; combinations of softeners were also tried on mixes of *Kok-sagyz* plus S.K.

The mixes were prepared as follows: First the rubber was passed twice through closely set rolls heated to 100° C., and loading was begun with rolls one millimeter apart. The time-table was: plasticizing rubber, three minutes; adding softener, six minutes; adding accelerators, one minute. Then the space between the rolls was increased to 2.5 millimeters, and the fillers were added. With the incorporation of carbon black taking 11 minutes and of sulphur, three minutes, the entire process took approximately 24 minutes.

The plasticity and tendency to scorch were determined on the day following preparation. Results of mechanical tests of vulcanizates reenforced with blacks are shown in Table 4, which indicates that with the addition of softener the mechanical strength of the vulcanizates increases (except machine oil) as compared with the control mix without softener; the resistance to aging improves, and much softer mixes are obtained; there is practically no change in scorching (except in the case of batkak). Of all the softeners used, stearic acid (five parts) was the most suitable; batkak ranked next.

Pine tar, mineral rubber, and machine oil gave reduced mechanical indexes, and the last two in particular were hard to incorporate in the rubber. In *Kok-sagyz* plus S.K. mixes (50%:50%) batkak gave somewhat better values for tensile strength than stearic acid, mineral rubber, and pine tar, but abrasion resistance was lower. Rate of cure for *Kok-sagyz* plus S.K. compounds, except the mixes with batkak, was lower, scorching and permanent elongation higher (the latter almost double) than in mixes of 100% *Kok-sagyz*. Best mechanical values were obtained with stearic acid plus mineral rubber, and batkak plus mineral rubber, in the proportion of 2.5 plus 2.5 parts (weight) on 100 weight parts of rubber.

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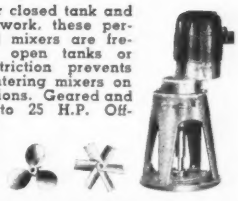

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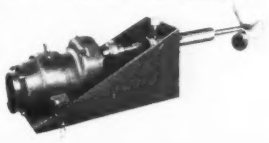

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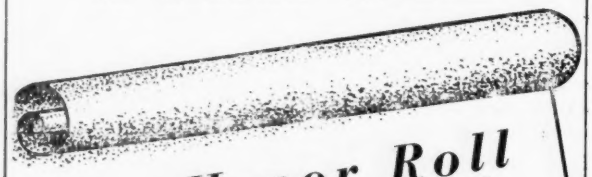

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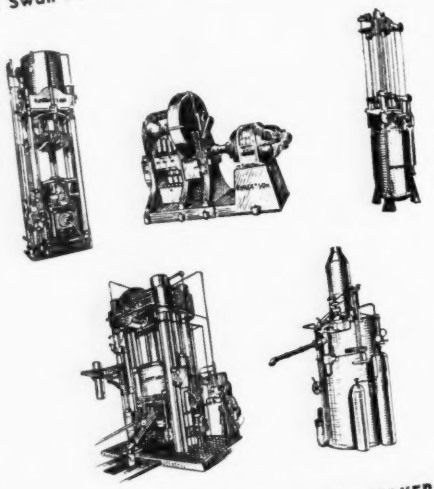

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Editor's Book Table

BOOK REVIEWS

"Handbook of Chemistry and Physics." Twenty-fifth Edition, 1941-42. Charles D. Hodgman, Editor-in-Chief, and H. N. Holmes, Associate Editor. Published by Chemical Rubber Publishing Co., 2310 Superior Ave., Cleveland, O. Fabrikoid, 4¾ by 7½ inches, 2521 pages. Indexed. Price $3.50.

Much new or completely revised material is contained in the latest edition of this standard reference book for physicists and chemists. The section on Properties of Commercial Plastics, revised for the 1939 edition, has been checked to assure up-to-date information on developments in this growing industry. A 15-page table of natural secants and co-secants for convenience in machine computation augments the mathematical section. The abbreviations and symbols used have been completely revised on the basis of a list proposed by the Committee of the American Association of Physics Teachers. Other revised or new matter incorporated in this edition for the first time places the data in accord with the results of recent scientific investigation.

"1941 Supplement to A.S.T.M. Standards Including Tentative Standards. Part 3, Nonmetallic Materials—General." Published by the American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa. December, 1941. Cloth, 6 by 9 inches, 641 pages. Price, $3.

This volume of the latest supplement to A.S.T.M. Standards contains in the approved form about 150 specifications, definitions, and tests, either issued for the first time in 1941 or revised, and covers the following materials: coal and coke, petroleum and lubricants, electrical insulating materials, plastics, rubber products, textiles, paper, soaps, etc.

The 15 methods of testing rubber and rubber products, latex, and sponge, and the three specifications for rubber insulated wire and cables are also reported in "A.S.T.M. Standards on Rubber Products", reviewed in our February issue. Eleven tentative methods of testing plastics for flammability, color fastness to light, impact resistance, tension, and other properties are given.

The 1941 supplement is the last that will be issued. A complete new book of standards will be prepared in 1942.

NEW PUBLICATIONS

"The Goodyear Guarantee and Tire Conditions." The Goodyear Tire & Rubber Co., Inc., Akron, O. 30 pages. Primarily designed to be used by dealers in explaining proper usage of tires and causes of tire failure to customers, this manual describes desirable qualities of tires and states controllable operating conditions which affect tire service and life. Photographs and diagrams illustrate causes of fabric breaks and tire damage; while the method by which an injured tire is restored to service is shown. Two pages of charts, said to be based on actual truck experience and tests, show the effect of various factors, such as inflation, speed, and temperature, on tire service.

"Wire Insulation Compounding." Report No. 4112-4. Naugatuck Chemical Division of United States Rubber Co., 1230 Sixth Ave., New York, N. Y. 21 pages. This report is based on laboratory experiments and factory practice in respect to wire insulation compounds, with recommendations presented for the use of accelerators, antioxidants, and specific types of special materials. Quantitative recommendations are summarized in a table and other supporting plant and laboratory data are given.

"1942 Year Book." The Tire & Rim Association, Inc., 305 Peoples Bank Bldg., Akron, O. December, 1941. Price $2 plus sales tax. 127 pages. This reference manual contains the latest standards, with sketches, for vehicle tires, tubes, rims, and rubber and metal valves. The classification is by tires as follows: passenger car, truck and bus, "off the road", agricultural, industrial, airplane, motorcycle. Specifications for wide base rim contours for 16-inch diameter and smaller low-pressure passenger balloon tires and rim contours for wide base rear tractor tires are included. Load and inflation tables are given by tire types and sizes.

"1942 Plastics Catalog." Plastics Catalog Corp., 122 E. 42nd St., New York, N. Y. 625 pages. Price $5. The 1942 catalog follows in general the arrangement of preceding ones. The divisions include: Materials; Plastics Engineering; Production Operation; Machinery and Equipment; Laminates and Vulcanized Fibers; Plastic Coatings; and Synthetic Fibers and Rubbers. Neoprene, "Thiokol", Koroseal, Hycar, Ameripol, Butyl rubber, Vistanex, Chemigum, and Resistoflex (polyvinyl alcohol) are given detailed treatment in the last-named section. Chlorinated rubber is discussed under Plastics Coatings. A new chapter, profusely illustrated, is devoted to plastics in defense. There are three charts: Plasticizers, Solvents, and Plastic Properties. The directories section contains several lists and indexes convenient to the trade. The 1942 edition should be a valuable guide to rubber manufacturers contemplating production in plastics or synthetic rubbers.

"Photoswitch Electronic Level Controls." Sheet 1100. Photoswitch, Inc., Cambridge, Mass. 4 pages. The operation and typical applications of electronic level controls, which maintain the liquid level in a tank between two prescribed points by virtue of self-activated electrical switches which control the pump, are described and illustrated in this folder.

"Let's Look It Up." Reinhold Publishing Corp., 330 W. 42nd St., New York, N. Y. 134 pages. This catalog of books on chemistry and related subjects for 1941-42 contains descriptive information on such standard works as "The Chemistry and Technology of Rubber" by Carroll C. Davis and John T. Blake, and other volumes of interest to the rubber industry as catalysis, colloid chemistry, emulsions, hydrocarbons, plastics, polymerization, protective coatings, rubber chemistry, and synthetic resins. A list of 87 American Chemical Society monographs, most of which are more fully described in the text, is appended. There are lists of new books published in 1941, and others to be published in 1942. Books listed as in preparation include "Colloidal Carbon" by W. B. Wiegand; "Chemistry of Synthetic Resins" Vol. 3, by Carleton Ellis; "Acetylene" by the associates of the late J. A. Nieuwland; and "Surface Energy and Colloidal Systems" by W. D. Harkins and T. F. Young.

"Technical Books on All Subjects—1942." Chemical Publishing Co., Inc., 234 King St., Brooklyn, N. Y. 60 pages. Indexed. This catalog describes books on a variety of technical subjects including chemistry, rubber, and plastics.

"Operator's Handbook." B. F. Goodrich Co., Akron, O. 97 pages. This booklet provides useful data on obtaining maximum service from truck tires. Charts and tables show the causes of uneven tread wear, the effect of overloads and excessive speeds in generating heat, the dangers of over- and under-inflation and mis-matching of dual tires. These factors are also summarized in a list of 20 practical rules. A table of weights and measures of commodities is included.

"The Sporting Goods Trade Directory." *Sporting Goods Dealer*, St. Louis, Mo. 672 pages. Price 50¢. **"Cotton Production and Distribution, Season of 1940-41."** Bulletin 178. 1941. Prepared by the Bureau of the Census, Dept. of Commerce. United States Government Printing Office, Washington, D. C. 63 pages. Price 10¢. **"The Ford Rubber Plantations."** The Ford Motor Co., Detroit, Mich, 1941. 32 pages. **"Ninth Annual Report."** Commodity Exchange, Inc., 81 Broad St., New York, N. Y. 1941. 12 pages. **"List of Inspected Gas, Oil, and Miscellaneous Appliances."** Underwriters' Laboratories, Inc., 207 E. Ohio St., Chicago, Ill. December, 1941. 166 pages.

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"List of Inspected Fire Protection Equipment and Materials." Underwriters' Laboratories, Inc., January, 1942. 170 pages. **"What A.C.C. & C.E. Offers You."** Association of Consulting Chemists & Chemical Engineers, Inc., 50 E. 41st St., New York, N. Y. 2 pages. **"Glass and Its Adaptibility to Modern Needs."** Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, Pa. 30 pages. **"A B C or Income Tax Returns."** General Atlas Carbon Co., Inc., 60 Wall St., New York, N. Y. 32 pages.

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Firestone Tester

(*Continued from page* 570)

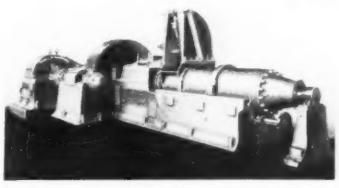
mulas given in Table 1, of course, were derived from the general differential equation for free vibration, assuming the elastic part of the resistance to deformation to be proportional to the deformation and the damping force proportional to the velocity. The resulting charts obtained with the machine have agreed quite well with this assumption, except in the case where an extremely large damping force exists, i.e., the case of a very dead stock.

While the high-frequency torsion tester is still considered an experimental device and has not yet been placed on the market, it has been found very useful in evaluating vibration damper stocks as well as tire stocks. Its results do not always correlate with rebound tests where both modulus and hysteresis are involved in determining the height of rebound. The use of a torsional vibration appears to have some advantage over the compressional vibration type of test since the problem of indeterminate slippage over the loaded surfaces is avoided.

F-B
PRODUCTION UNITS
***for* Plants with Army and Navy Production Schedules**

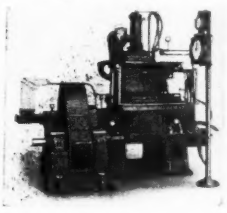
To meet the day's demand for war material deliveries and to cope with the upheaval in materials and methods, consider the advantages of F-B Production Units.

They are key units in mill rooms arranged for continuous processing and mechanized material handling to obtain faster production and sustained high efficiency. They meet the demand for increasing present output for war requirements.



Improved plasticity and high productive capacity at low cost characterize the performance of the Gordon Plasticator.

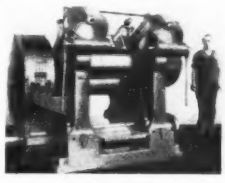
Single units, or combinations of several machines laid out for continuous work flow, yield important results in the urgent war-time need for faster production, and at the same time lower the cost per unit of output.



Banbury Mixers are essential units in low cost production of quality products.

F-B engineers offer an extensive and unsurpassed experience in mill room problems to aid in selecting the correct combination of Production Units and the best layout for maximum results.

F-B Production Units are part of our regular line of rubber machinery. Although our plants are heavily engaged in the production of equipment for the Army and Navy, we are still able to build rubber machinery which is to be used in the production of war materials if orders are accompanied by suitable priority ratings.



Tilted Refiners provide continuous high output and improved quality of reclaim.

FARREL-BIRMINGHAM COMPANY, INC.
234 North Cliff St., Ansonia, Conn.

Patents and Trade Marks

APPLICATION

United States

21,987. (Reissue.) **Railway Car Truck Bolster Stabilizing Means** Having Rubber Disk Parts. V. L. Green, Milwaukee, Wis., assignor to General Steel Castings Corp., Eddystone, Pa.

2,266,007. **Ice Tray** with Removable Rubber Lining Member. H. B. Copeman, assignor to Copeman Laboratories Co., both of Flint, Mich.

2,266,270. **Elastic Container Closure.** A. G. Roth, Mineola, N. Y.

2,266,275. **Platen** for Typewriters, Etc. H. Schuler, Shonau, assignor to Wanderer-Werke A.G., Siegmar-Schonau, both in Germany.

2,266,317. **Toe Protector** Comprising an Elastic Sleeve. M. F. Hazen, Sacramento, Calif.

2,266,387. **Window Construction** with Rubber Cushioning and Sealing Member. H. M. Woelfel, assignor to Robert Mitchell Co., Ltd., both of Montreal, P. Q., Canada.

2,266,390. **Play Ball** Including a Resilient Member of Fibrous Material, Containing a Deposit of Deadening Material Adapted to Reduce the Reactance of the Resilient Member. P. E. Blanchfield and R. A. Stafford, assignors to A. G. Spalding & Bros., Inc., both of Chicopee, Mass.

2,266,394. **Windshield Wiper.** E. C. Horton, Hamburg, assignor to Trico Products Corp., Buffalo, both in N. Y.

2,266,429. **Pencil Cap and Eraser.** S. G. Lopez, San Francisco, Calif.

2,266,464. **Flooring** Yieldingly Joined Using Reversible Key Strips of Rubber Composition. H. T. Kraft, assignor to General Tire & Rubber Co., both of Akron, O.

2,266,476. **Shoe** with Air Bulb in the Heel Portion Which Is Compressed under the Action of Walking. W. A. Riess, Chicago, Ill.

2,266,498. **Clothes Wringer** Having a Resilient Tube Mounted on the Drip Board and Engaging One of the Rolls. W. L. Kauffman, II, assignor to Lovell Mfg. Co., both of Erie, Pennsylvania.

2,266,506. **Flexible Fruit Sizing Roll.** J. W. Morse, East Lansing, Mich., assignor to Food Machinery Corp., San Jose, Calif.

2,266,518. **Slip** with Elastic Fabric Sections. J. L. Sarge, New York, N. Y.

2,266,523. **Electric Condenser Terminal Structure** with Soft Rubber Plug Held under Compression about the Wire Terminals. H. Waterman, assignor to Aerovox Corp., both of Brooklyn, N. Y.

2,266,561. **Rubber Comb** Containing Sufficient Electrically Conductive Carbon Black to Dissipate Static Electricity. L. Marick, Grosse Pointe Farms, Mich., assignor to United States Rubber Co., New York, N. Y.

2,266,588. **Elastic Binding** Containing Rubber Warp Strands for Footwear. R. T. Dawes, assignor to Thomas Taylor & Sons, Inc., both of Hudson, Mass.

2,266,699. **Wood Veneer** Having an Application of Vulcanized Latex on One Side. J. S. Williamson, Baltimore County, Md.

2,266,716. **Glove** with Finger Tips of Reduced Cross-Section. I. W. Robertson, Los Angeles, Calif.

2,266,801. **Combination Resilient Sealing Strip and Garnish Molding** for Vehicle Window. J. S. Reid, Shaker Heights, assignor to Standard Products Co., Port Clinton, both in O.

2,266,886. **Protective Body Pad** Having Cushioning Elements Enclosed in an Elastic Sheath. A. M. McCoy, Waterville, Me., assignor to B. F. Goodrich Co., New York, N. Y.

2,266,984. **Railway Brake Head** Having a Rubber-Like Insert Yieldingly Engaging a Brake Shoe. A. C. Moore, Winnetka, assignor to Chicago Railway Equipment Co., Chicago, both in Ill.

2,267,084. **Resilient Wheel** for Vehicles. M. Benito y de la Rosa, Habana, Cuba.

2,267,113. **Nursing Bottle Holder** Utilizing Suction Cups. G. M. Kyprie, New York, N. Y.

2,267,172. **Resilient Mounting** for Use between Two Relatively Movable Members. C. Saurer, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,267,214. **Railway Car End Structure.** A. F. O'Connor, assignor to Union Asbestos & Rubber Co., both of Chicago, Ill.

2,267,218. **Foot Pump** with Cup-Shaped Yielding Member. J. O. Reinecke, Oak Park, Ill., assignor to Vestal Chemical Co., St. Louis, Mo.

2,267,279. **Refrigerator Cabinet** with Resilient Backing Strip Part. W. A. Kuenzli, Evansville, Ind., assignor to Servel, Inc., New York, N. Y.

2,267,280. **Flexible Walled Device** to Convey Fluids. C. Kuhnel, Berlin-Charlottenburg, assignor to Patentverwertungs-Gesellschaft mit beschrankter Haftung "Hermes," Berlin, both in Germany.

2,267,285. **Elastic Fishing Tackle.** J. J. McCrave, New York, N. Y.

2,267,288. **Goggle-Spectacles** Having Sponge Rubber-Backed Bridge Portion. R. M. Rooke, Jersey City, N. J., assignor to Air Reduction Co., Inc., New York, N. Y.

2,267,310. **Soap Package** Comprising Wrapping Material Provided with a Coating of Vinyl Resin. W. V. Shearer, West Springfield, and G. Householder, Holyoke, both in Mass., assignors to Plastic Coating Corp., a corporation of Mass.

2,267,312. **Rubber Torsion Spring.** J. F. Downie Smith, assignor to Edward G. Budd Mfg. Co., both of Philadelphia, Pa.

2,267,320. **Packaging Material** Formed of Flexible Laminated Sheet Material, the Inner Lamina a Rubber Composition. S. H. Berch, Los Angeles, Calif.

2,267,403. **Furniture Caster** Having a Wheel with an Elastic Cushion Portion and a Harder Floor-Engaging Skin Portion. W. F. Herold, Easton, assignor to Bassick Co., Bridgeport, both in Conn.

2,267,406. **Tire Tread.** F. A. Krusemark, Chicago, Ill.

2,267,433. **Continuous Rubber Weather Strip.** C. A. Tea, Detroit, assignor to Chrysler Corp., Highland Park, both in Mich.

2,267,475. **Resilient Element** for Cushioning Purposes. K. J. Miller, Pittsburgh, Pa., assignor to Waugh Equipment Co., New York, N. Y.

2,267,519. **Play Ball** Consisting Essentially of a Cured Mixture of 40-60 Parts Rubber and 40-60 Parts of the Hard Nontriable Reaction Product of Rubber with a Material from the Group Consisting of Sulphuric Acid, Sulphonic Acids, and Sulphonyl Chlorides. J. B. Dickson, Northampton, and R. A. Stafford, Chicopee, both in Mass., assignors to A. G. Spalding & Bros., Inc., New York, N. Y.

2,267,530. **Hose** Comprising Rubber-Like Material and Sheets of Reenforcing Material. A. D. Maclachlan, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,267,547. **Facial Machine** with a Thick Dished Liquid-Absorbent Pad of Soft Open-Celled Rubber Mounted within a Concavo-Convex Shell, a Heater Associated with the Shell and Means for Circulating the Heated Air and Projecting It against and through the Pad. C. E. Zimmerman, Chicago, Ill.

2,267,610. **Continuous Electrical Wall Outlet** Comprising a Body in the Form of an Elongated Rubber Strip Having Parallel Slots, Resilient Conductors in the Slots, and a Thin, Integral Flexible Member on the Body Permitting It to Be Folded Away to Expose the Slots for the Insertion of the Prongs of a Connector. N. La Jone, Sr., Chicago, Ill.

2,267,630. **Electric Wire Splicing Sleeve** of Flexible Rubber. F. J. Weiland, Chicago, Ill.

2,267,654. **Milk Bottle Cream Separator** Using a Disk of Flexible Resilient Material. E. Hedenskoog, Muskegon, Mich.

2,267,707. **Automobile Headlight Adapter Support** with a Resilient Ring. N. W. Bosten, Cleveland, O.

2,267,874. **Engine Mounting Device** Employing Elastic Deformable Rings. E. P. Renaux, Paris, and L. J. Renaus, Livry-Gargan, both in France.

2,267,909. **Syringe.** H. Grauert, assignor, by direct and mesne assignments, to F. Plattner, both of Elmhurst, N. Y.

2,267,930. **Sealing Unit** Having a Housing Member and a Rubber-Like Sealing Member therein. S. C. Leonard, Jr., Detroit, Mich.

2,267,931. **Oil Seal** Having Annual Ring of Molded Hardened Plastic Material in Engagement with a Cylindrical Packing Member. S. C. Leonard, Jr., Detroit, Mich.

2,267,981. **Elastic Pulley and Wheel, Etc.** M. F. A. Julien, Paris, France.

2,268,023. **Typewriter Eraser** Containing a Magnetic Member. G. N. Dunn, Rensselaer, Ind.

2,268,145. **Anesthesia Administering Device.** C. Welty, assignor to Puritan Compressed Gas Corp., both of Kansas City, Mo.

2,268,182. **Washing Machine Lint Catcher** with Resilient Plugs Closing End Openings. E. Bowers, Greenville, Iowa.

2,268,223. **Multiple Conductor Cable** for Use under High Pressure or at Great Depths Containing a Plurality of Rubber Insulated Conductors. T. F. Peterson, Worcester, Mass.

2,268,249. **Tire.** D. M. Goodrich, Mount Kisco, N. Y.

2,268,253. **Windshield Wiper** with Means for Feeding Liquid to the Inner End of the Blade. F. L. Hill, Garden City, and C. F. Thompson, Westbury, assignors to Air Associates, Inc., Garden City, all in N. Y.

2,268,295. **Sign Printing Device** Utilizing a Squeegee and a Frame for Holding a Screen over a Sign Blank. S. J. Mollett, assignor to Massillon-Cleveland-Akron Sign Co., both of Massillon, O.

Dominion of Canada

401,066. **Impact-Withstanding and Spring-Providing Material,** Including a Rubber-Impregnated Carcass, a Soft Rubber Shock Pad, and a Compounded Rubber Cover Enclosing the Carcass and Pad, the Whole Being Vulcanized to Form a Compact Mass. W. H. Curry and J. T. Potts, co-inventors, both of Salt Lake City, Utah, U. S. A.

401,094. **Binder Reel Attachment** with Rubber Blades. C. Nordhougen, Leeds, N. Dak., U. S. A.

401,112. **Cleaning Pad** Having a Porous Rubber Core. H. J. Zinn, Wilkes-Barre, Pa., U. S. A.

401,113. **Rubber Glazing Strip.** Adlake Co., Chicago, Ill., assignee of C. M. Verhagen, Elkhard, Ind., both in the U. S. A.

401,126. **Electric Service Entrance Cable** Having a Pair of Rubber Insulated Conductors. American Steel & Wire Co. of N. J., Cleveland, O., assignee of C. L. Chatham, Nutley, N. J., both in the U. S. A.

401,163. **Flexible Fluid Pressure Container.** Firestone Tire & Rubber Co., Akron, O., U. S. A., assignee of Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of R. W. Brown, Akron, O., U. S. A.

401,175. **Pants** with Elastic Fabric Section. J. B. Lewis & Sons, Ltd., Nottingham, assignee of M. P. Shanahan, London, and J. E. Mortimer, Nottingham, all in England.

401,202. **Horseshoe** Having Calk Elements Covered with Elastic Friction Material. J. Kocontes, inventor, and G. Gavaris, assignee of 50% of the interest, both of Montreal, P. Q.

United Kingdom

540,606. **Packaging.** Wingfoot Corp.

540,682. **Cushion Pad** for Hand Vibrators. F. B. Dehn, (J. Oster Mfg. Co.).

540,711. **Airplane Deicer.** W. C. Clay.

540,757. **Respirators.** G. R. Fountain, Ltd., A. E. C. Snell, and H. J. Houlgate.

540,815. **Shuttles for Ribbon Looms.** Continental Elastic Corp.

540,901. **Reciprocating Pumps** for Delivering Liquids. Dunlop Rubber Co., Ltd., and H. Trevaskis.

540,997. **Clothes Wringers.** British Thomson-Houston Co., Ltd.

541,142. **Suction Squeegee.** R. G. Dixon & Co., Ltd., and W. J. Bridge.

541,169. **Pile-Fabric Floor Coverings.** United States Rubber Co.

541,268. **Aircraft Deicers.** R. H. Burgess.

541,361. **Coated Wires.** E. I. du Pont de Nemours & Co., Inc.

PROCESS

United States

2,266,226. **Flexible Hose** Comprising Windings of Rubber Strips Heat-Treated to Form an Integral Casing. A. W. Mall, Chicago, Ill.

2,266,263. **Dipped Rubber Articles** Using a Wire Mesh Form Having an Ornamentation or Mark of Sufficient Fineness to Retain Liquid Coagulant in the Interstices thereof. P. A. Raiche, Providence, R. I., assignor to Davol Rubber Co., a corporation of R. I.

2,268,049. **Making Pneumatic Rubber Material** by Preparing a Thick, Flexible Base Element Having Pockets Extending Inwardly from One Surface thereof, Expanding a Smaller, Thin, Rubber Sealing Element by Immersion in Gasoline until It Is the Same Size as the Base Element, Cementing the Expanded Sealing Element to the Base Element to Form Air Cells, Whereby, upon Evaporation of Gasoline, the Latter Will Be Normally Under Tension. C. V. McGuire, Grosse Pointe Park, assignor to Airfilm Corp., Detroit, both in Mich.

2,268,334. **Building a Tire Band.** A. C. Hirsch, J. F. Cullen, A. R. Krause, and H. O. Hutchens, all of Eau Claire, Wis., assignors, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,268,621. **Making Closed Cell Gas Expanded Rubber** by a Combination of External and Internal Gases. D. Roberts, New York, N. Y., and L. Cooper, Monson, Mass., assignors to Rubatex Products, Inc., New York, N. Y.

2,268,678. **Patterned Perforated Rubber Sheets.** H. C. Tingey, Nutley, N. J., assignor to United States Rubber Co., New York, N. Y.

2,268,865. **Making Grooved Raw Edge Belts** by Building up the Body of the Belt in the Form of Laminated Fabricated Rubber Layers on a Mandrel Having Surface Configurations, Compressing the Layers, Vulcanizing the Belt Body While Compressed on the Mandrel, and Cutting Belts from the Built-up Cylinder. A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

Dominion of Canada

400,669. **Polyvinyl Acetal Resin Sheet Forming Method.** Monsanto Chemical Co., St.

Louis, Mo., assignee of Fiberloid Corp., Indian Orchard, assignee of G. J. Esselen, Swampscott, and E. R. Derby, Springfield, co-inventors, all in Mass., all in the U. S. A.

401,199. **Slitting an Elastic Shoe Outsole.** United States Rubber Co., New York, N. Y., assignee of P. A. Sperry, New Haven, Conn., both in the U. S. A.

401,211. **Making an Adhesive Sheet** by Unifying a Porous Paper Sheet by Impregnating with a Solution Prepared by Dry-Mixing Broken-Down Rubber and Combining It with Zinc Oxide and Rosin and a Volatile Hydrocarbon Solvent, Drying the Resultant Saturated Paper, and Coating It with a Pressure-Sensitive Adhesive. Minnesota Mining & Mfg. Co., assignee of R. C. Drew, both of Saint Paul, Minn., U. S. A.

401,413. **Cavitied Rubber Sheeting.** International Latex Processes, Ltd., St. Peters Port, Channel Islands, assignee of J. U. Mann, Kearny, N. J., U. S. A.

401,414. **Laminated Cavitied Deposition Blanket.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of J. McGavack, Leonia, and C. E. Linscott, Ridgewood, co-inventors, both in N. J., U. S. A.

401,569. **Fine Threads or Filaments** Produced by Extruding Rubber Latex through Vertically Arranged Nozzles into a Coagulant, and Providing at Least Two Pull-Rolls Arranged So That the Filaments Are Prevented from Touching One Another. International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of S. F. Smith and R. G. James, co-inventors, both of Birmingham, Warwickshire, England.

401,901. **Rubber Hydrochloride Film Manufacture.** Wingfoot Corp., Wilmington, Del., assignee of G. C. Mack, Akron, O., both in the U. S. A.

402,253. **Manufacture of Tape** Which Comprises Applying to One Face of a Thin Strip of Flexible Stretchable Porous Fibrous Material a Plurality of Coats of Thick Viscous Rubber Composition Having a Solvent and Vulcanizing Agent for the Rubber and a High Percentage of Filler Material, Applying to the Other Face an Aqueous Rubber Latex Dispersion Including a Vulcanizing Agent, in Such Manner That It Penetrates through the Strip and Forms a Bond between the Latter and the Innermost Coat, Vulcanizing the Strip, and Finally Applying a Pressure Sensitive Adhesive Coating to the Other Side of the Strip. Van Cleef Bros., assignee of P. Van Cleef, both of Chicago, Ill., U. S. A.

United Kingdom

539,980. **Inner Tubes.** Firestone Tire & Rubber Co., Ltd.

540,568. **Production of Goods** of or Containing Rubber or Similar Material. International Latex Processes, Ltd., D. F. Twiss, and P. H. Amphlett.

540,710. **Rubber Thread.** United States Rubber Co.

540,917. **Sponge Rubber.** British Rubber Producers' Research Assn. and S. C. Stokes.

540,927. **Repairing Rubber Wellington Boot Heels.** H. P. Pracey.

541,140. **Preparation of Purified Latex and Rubber therefrom.** British Rubber Producers' Research Assn. (Rubber Research Station).

541,196. **Making Molds and Patterns.** United States Rubber Co.

541,898. **Purification of Resinous Rubber Transformation Products.** Albert Products, Ltd., and S. R. W. Martin.

541,899. **Manufacture of Rubber Transformation Products.** Albert Products, Ltd., and S. R. W. Martin.

Germany

706,761. **Uniting Synthetic Rubber Layers of Butadiene Mixed Polymerizates with Fabric Inserts,** Intended Especially for Vehicle Tires. Continental Gummi-Werke A.G., Hannover.

MACHINERY

United States

21,990. (Reissue.) **Machine for Covering an Elastic Filament with Yarn or Thread.** G. Rosenfeld, assignor to Waverly Yarn Corp., both of Elizabeth, N. J.

2,266,044. **Apparatus to Produce Rubber Hydrochloride.** H. F. Irving and F. E. Williams, assignors to Marbon Corp., all of Gary, Ind.

2,266,527. **Patch Cutter.** J. Wimmer, assignor to Van Cleef Bros., both of Chicago, Ill., a partnership consisting of N., P., and F. Van Cleef.

2,268,548. **Inner Tube Tester.** L. A. Hendrickson, Friendship, Me.

2,266,592. **Apparatus and Method for Wrapping Annular Objects.** E. Eger, Grosse Pointe Park, Mich., assignor to United States Rubber Co., New York, N. Y.

2,266,720. **Tire Repair Vulcanizer.** P. O. Chambers, assignor to Safety Vulcanizer Co., Both of Chicago, Ill.

2,266,956. **Tube Vulcanizer.** J. W. Brundage, assignor to Summit Mold & Machine Co., both of Akron, O.

2,267,243. **Retreading Mold.** D. M. MacMillan, Macon, assignor to MacMillan Electric Mold & Rubber Co., Inc., Baldwin County, both in Ga.

2,267,942. **Apparatus and Method for Making Sheet Rubber.** J. F. Morse, Hudson, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,268,420. **Machine to Apply Marginal Coatings to Articles.** H. R. Polleys, New Haven, Conn., assignor to United States Rubber Co., New York, N. Y.

2,269,137. **Tire Tread Treating Apparatus.** G. F. Wikle, Ann Arbor, Mich., assignor to United States Rubber Co., New York, N. Y.

2,269,299. **Winder for Elastic Yarn.** L. A. Wiggins, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,269,388. **Extrusion Molding Machine** for Granular Material Including a Mold and an Injection Cylinder. M. F. Weida, Louisville, O.

Dominion of Canada

401,510. **Tire Vulcanizer.** McNeil Machine & Engineering Co., assignee of L. E. Soderquist, both of Akron, O., U. S. A.

401,642. **Cord Stretcher and Winder.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. A. Newton, Jr., Winnsboro, S. C., and D. T. Austin, Jr., Hogansville, Ga., co-inventors, both in the U. S. A.

401,687. **Washer Forming Punching Machine.** United States Rubber Co., New York, N. Y., assignee of A. N. Ikanayan and R. G. Null, co-inventors, both of Indianapolis, Ind., all in the U. S. A.

401,705. **Coating Apparatus.** Carborundum Co. (a Delaware corporation), assignee of Carborundum Co. (a Pennsylvania corporation), assignee of R. L. Melton, R. C. Benner, and H. P. Kirchner, co-inventors, all of Niagara Falls, N. Y., U. S. A.

401,829. **Tire Casing Making Apparatus.** Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of J. W. M. Hill, Buenos Aires, Argentina.

401,839. **Plastic Material Mixing Mill.** Firestone Tire & Rubber Co., assignee of R. W. Allen, both of Akron, O., U. S. A.

401,903. **Tire-Building Machinery.** Wingfoot Corp., Wilmington, Del., assignee of J. I. Haase, Akron, O., both in the U. S. A.

401,970. **Vulcanizable Contoured Sheet Manufacturing Apparatus.** Baldwin Rubber Co., assignee of A. McDonald, both of Pontiac, Mich., U. S. A.

402,016. **Textile Fiber Treating Apparatus and Elastic Yarn Manufacture.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of B. H. Foster, Maplewood, N. J., U. S. A.

402,115. **Rubber Ribbon Thread Separating Apparatus.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of R. S. Francis, Rumford, R. I., U. S. A.

CHEMICAL

United States

2,266,159. **Preparation of a Moisture Vapor-Proof Lacquer** Which Comprises Fusing together a Fusible Resin and a Wax into a Homogeneous Melt, and Dissolving the Mixture and a Halogenated Rubber and a Plasticizer in a Suitable Volatile Organic Solvent. E. H. Bucy, Stamford, Conn., assignor to Atlas Powder Co., Wilmington, Del.

2,266,177. **Purifying Monomeric Vinyl Chloride** Obtained in Pyrolyzing Ethylene Chloride. R. C. Dosser and J. B. Arnold, assignors to Dow Chemical Co., all of Midland, Mich.

2,266,203. **Penetration Control of Aqueous Rubber** Which Consists in Subjecting the Base to a Solution Containing a Tetra-Borate, Then Applying an Aqueous Rubber Composition Containing a Vegetable Gum Gellifiable by the Borate, Drying, and Vulcanizing the Resulting Product. G. S. Hiers, Bala-Cynwyd, assignor to Collins & Aikman Corp., Philadelphia, both in Pa.

2,266,576. **Increasing Resistance of Rubber to Flex-Cracking** Which Comprises Treating It with a Mono-N-Methyl Diaryl-Arylene Diamine. W. F. Tuley and P. T. Paul, both of Naugatuck, Conn., assignors, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,266,601. **Antioxidant**—A Carbamyl-Amino Diarylamine Having the Carbamyl Group Directly Attached to the Primary Amino Nitrogen Atom of the Amino Diarylamine. L. H. Howland, Nutley, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,266,602. **Antioxidant** Having the General Formula $R_1—N—R_2—N—$Alkylene$—CO—Y'$ Where R_1 Is an Aryl Group; R_2 Is an Arylene Group; and Y' is a Member Selected from the Group Consisting of an Amino, -O-Metal, -O-Ammonium, Hydroxy, Alkoxy and an Aryloxy Group. L. H. Howland, Nutley, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,266,603. **Antioxidant**—An N-Carbalkoxy-Para-Amino-Diarylamine. L. H. Howland, Nutley, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,266,794. **Producing Rubber-Like Interpolymers of Butadiene Hydrocarbons and Fumaric Acid Esters.** W. Pannwitz, Merseburg, B. Ritzenthaler, Duisburg-Hamborn, and H. H. and G. Steinbrunn, both of Ludwigshafen-on-the-Rhine, assignors to I. G. Farbenindustrie A.G., Frankfort a.M., all in Germany.

2,267,151. **Aromatic-Hydrocarbon-Soluble Embedding Medium** for Specimens for Microscopic Study Susceptible to Microtomy and Removal by Solution, Consisting of Paraffin Wax Modified by Admixture with a Substance from the Group of Hydrogenated Polymers of Cyclopentadiene, Di-Cyclopentadiene, Coumarone, Indene, Etc., together with a Flexiblizing Agent (Rubber, Polymerized Chloroprene, Polymerized Butadiene, Polymerized Isobutylene, Polymerized Isoprene, Polymerized Divinyl Acetylene, Etc.). P. Gray, Pittsburgh, Pa., assignor to Stoner-Mudge, Inc., a corporation of Pa.

2,267,730. **Synthesizing Hydrocarbons** Which Comprises Reacting an Isoparaffin with an Olefin under Alkylating Conditions and in the Presence of a Hydrogen Fluoride Catalyst. A. V. Grosse and C. B. Linn, assignors to Universal Oil Products Co., all of Chicago, Ill.

2,267,737. **Polymerization of Olefins** by Subjecting the Olefins to Contact with a Catalyst Comprising a Complex Formed by the Interaction of Dioxane and Sulphuric Acid. V. N. Ipatieff and V. Haensel, assignors to Universal Oil Products Co., all of Chicago, Ill.

2,267,777. **Heat-Stable Vinyl Resin** Containing as Stabilizer an Organo-Metallic Compound of Lead or Tin with Oxygen and Hydroxyl Radicals. V. Yngve, Lakewood, O., assignor to Carbide & Carbon Chemicals Corp., a corporation of N. Y.

2,267,778. **Heat-Stable Vinyl Resin** Containing as Stabilizing Material an Organo-Metallic Lead Salt of a Fatty Acid Containing More Than Eight Carbon Atoms. V. Yngve, Lakewood, O., assignor to Carbide & Carbon Chemical Corp., a corporation of N. Y.

2,267,779. **Heat-Stable Vinyl Resin** Having a Stabilizer Comprising an Organo-Metallic Tetra-Alkyl Derivative of Tin. V. Yngve, Lakewood, O., assignor to Carbide & Carbon Chemicals Corp., a corporation of N. Y.

2,267,829. **Decolorizing Crude Vinyl Methyl Ketone.** H. Lange and O. Horn, both of Frankfurt a.M.-Hochst, assignors to I. G. Farbenindustrie A.G., Frankfurt a.M., all in Germany.

2,267,830. **Resin Coating** Comprising the Heat Reaction Product of a Plurality of Furane Units (Furfuraldehyde and Furfuralcohol) and Vinyl Units (Vinyl Chloride and Vinyl Acetate). H. F. Lewis, assignor to Institute of Paper Chemistry, both of Appleton, Wis.

2,268,169. **Leather Substitute** Comprising Polymer in the Form of a Cellular Spongy Pliable Sheet Material; the Polymer Is the Reaction Product of Monoaminomonocarboxylic Acids and Mixtures of Diamine with Dibasic Carboxylic Acid. J. B. Miles, Greenville, assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, both in Del.

2,268,162. **Halogenated Derivatives of Ethylene Polymers.** J. R. Myles and F. S. Bridson-Jones, both of Northwich, England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,268,177. **Completely Homogeneous, Heat and Light Stable Product** Resulting from Copolymerization of an Equimolar Mixture of Polymer-Free Monomeric Methyl Alpha-Chloracrylate and Polymer-Free Monomeric Styrene. H. W. Arnold, Marshallton, assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, both in Del.

2,268,398. **Vulcanizing Rubber** in the Presence of an Accelerator Embodying a 5-Membered Heterocyclic Nucleus Embodying Four Directly Connected Ring Carbon Atoms, and a Ring Nitrogen Atom, the Carbon Atom in the 2 Position Directly Adjacent the Ring Nitrogen Atom Being Directly Linked Exteriorly of the Nucleus to a Sulphur Atom. L. H. Howland, Nutley, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

Dominion of Canada

401,368. **Making a Solvent, Oil and Water Resistant Rubber Hydrochloride Composition** Which Comprises Reacting Solid Rubber with Gaseous Hydrogen Chloride at Approximately 120° C. to Produce a Substantially Saturated Product. Marbon Corp., Gary, Ind., assignee of H. A. Winkelmann, Chicago, Ill., E. W. Moffett, Milwaukee, Wis., and W. C. Calvert, Gary, Ind., co-inventors, all in the U. S. A.

401,436. **Light Polarizer** Consisting of a Sorption Complex of a Stain on Molecularly Oriented Solid Polyvinyl Alcohol. E. H. Land, Boston Mass., U. S. A.

401,533. **Process for the Catalytic Dehydrogenation of a Butane to a Butylene** in the Presence of a Catalyst Having the Characteristics of an "Activated Alumina." Shell Development Co., San Francisco, Calif., U. S. A., assignee of H. P. A. Groll, Hamburg-Wellingsbuttel, Germany, and J. Burgin, Oakland, Calif., U. S. A., co-inventors.

401,902. **Rubber-Like Material** Consisting of a Copolymer of Butadiene and Vinylidene Chloride Prepared from a Monomeric Mixture Containing from 50 to 65% of Butadiene. Wingfoot Corp., Wilmington, Del., assignee of L. B. Sebrell, Silver Lake, O., both in the U. S. A.

401,918. **Production of Styrene** by Heating a Mixture of Vapors of Benzene and Acetylene at Diminished Pressure. Consortium fur Elektrochemische Industrie, G.m.b.H., Munich, assignee of M. Mugdan, Munich-Grosshesselohe, and J. Sixt, Burghausen, co-inventors, all in Germany.

United Kingdom

540,587. **Mercapto-Arylthiazoles.** Wingfoot Corp.

541,706. **Hydrocarbons of High Molecular Weight.** W. Scott, F. F. Snowdon, P. H. Sykes, W. Whitehead, and Imperial Chemical Industries, Ltd.

541,167. **Rubber Derivatives or Resins.** British Rubber Producers Research Assn. and E. H. Farmer.

541,296. **Synthetic Latex-Like Emulsions.** I. G. Farbenindustrie A.G.

541,539. **Artificial Dispersions of Rubber, Etc.** British Rubber Producers Research Assn. and C. M. Blow.

541,461. **Nitrogen Generating Chemicals.** United States Rubber Co.

541,480. **Blown Fatty Alcohol Compositions.** National Oil Products Co.

541,597. **Plasticized Polyvinyl Chloride Products.** British Thomson-Houston Co., Ltd.

541,797. **Manufacture of Styrene.** Instituto Per Lo Studio Della Gomma Sintetica and G. Natta.

UNCLASSIFIED

United States

2,266,104. **Preparation of Carbon Black.** M. R. Vogel, Easton, Pa., and J. W. Snyder, Scotch Plains Township, N. J., assignors to Binney & Smith Co., New York, N. Y.

2,266,260. **Titanium Oxide Pigment Production.** J. H. Peterson, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,266,327. **Tire Spreader.** W. S. McGowan, Custroville, Calif.

2,266,480. **Switch** for Vulcanizing Machines. L. Steiner, Richmond, England.

2,267,127. **Pencil Eraser Mounting.** L. J. Most, Hudson County, N. J.

2,267,720. **Apparatus for Making Zinc Oxide.** H. M. Cyr, Palmerton, and G. W. Bishing, Lehighton, both in Pa., assignors to New Jersey Zinc Co., New York, N. Y.

2,268,031. **Circuit Maker** for Tire Deflation Signaling Devices. G. G. Guthrie, Tulsa, Okla.

2,268,353. **Stabilization of Insecticide Materials.** W. P. ter Horst, Packanack Lake, N. J., assignor to United States Rubber Co., New York, N. Y.

2,268,503 and 2,268,504. **Radioactive Alloy.** J. H. Dillon, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,269,004. **Holding and Releasing Mechanism** for Railroad Hand Brakes. H. D. Breen, assignor to Union Asbestos & Rubber Co., both of Chicago, Ill.

2,269,139. **Process for Producing Improved Titanium Pigments.** J. E. Booge, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,269,832. **Seat Construction.** G. V. Soper, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,270,148. **Low Tire Pressure Indicator.** L. V. Stowe, Junction City, assignor of 50% to G. W. Sheehan, Daly City, both in Calif.

2,270,432. **Yarn Binder** for Knitting Machines with an Elastic Yarn Feeding Means. O. Fregeolle, assignor to Hemphill Co., both of Central Falls, R. I.

2,270,499. **Tubular Element** Adapted to Conduct Air to a Spare Tire within a Closed Compartment of a Vehicle. W. R. Brewster, Albany, N. Y.

2,270,549. **Control Valve** for Fluid Operated Devices. G. H. Orr, assignor to General Tire & Rubber Co., both of Akron, O.

2,270,585. **Hydraulic Pressure Pulsating Mechanism.** R. J. Gartner, Canton, assignor to General Tire & Rubber Co., Akron, O.

2,270,586. **Vehicle Brake Pulsator** and Method of Braking. C. J. Jahant, Akron, W. C. McCoy, Shaker Heights, and H. T. Kraft, assignors to General Tire & Rubber Co., both of Akron, all in O.

2,270,758. **Tire Removing Tool.** G. M. Meinzinger, Rockwood, assignor to Chrysler Corp., Highland Park, both in Mich.

2,270,759. **Tire Removing Tool.** G. M. Meinzinger, Rockwood, assignor to Ball & Ball Carburetor Co., Detroit, both in Mich.

Dominion of Canada

401,086. **Tire Wheel Rim.** R. H. Lewis, Chicago, Ill., U. S. A.

401,333. **Parasiticidal Preparation.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Packanack Lake, N. J., U. S. A.

401,636-401,638. **Parasiticide.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Packanack Lake, N. J., U. S. A.

401,639. **Insecticide Stabilization.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Packanack Lake, N. J., U. S. A.

401,640. **Insecticide and Insect Repellent.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Packanack Lake, and R. W. Eldridge, Nutley, co-inventors, both in N. J., U. S. A.

401,641. **Parasiticide.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Packanack Lake, N. J., U. S. A.

401,643. **Nitrogen Generating Chemical.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. V. Smith, Nutley, N. J., U. S. A.

401,853. **Tire Tool.** Kennedy Service Tools Co., Mogadore, assignee of R. S. Worthington, Akron, both in O., U. S. A.

402,017. **Parasiticidal Preparation.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Packanack Lake, N. J., U. S. A.

402,188. **Fungicide.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Packanack Lake, N. J., U. S. A.

United Kingdom

540,964. **Circular Knitting Machines and Methods of Feeding Elastic Thread therein.** Scott & Williams, Inc.

541,302. **Radio-Active Alloys.** Firestone Tire & Rubber Co.

541,804. **Valves** for Rubber Tubes, Etc. Firestone Tire & Rubber Co., Ltd., and S. W. Hoffman.

541,740. **Rims** for Tractors and Other Pneumatic Tired Vehicles. Dunlop Rubber Co., Ltd., and J. Wright.

541,936. **Tire Cords.** British Celanese, Ltd.

TRADE MARKS

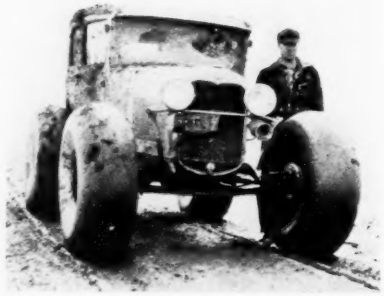
United States

391,574. **Miracle Mitts.** Treated mittens for care of the hands. Tillotson Rubber Co., Inc., doing business as Pilgrim Mfg. Co., Needham Heights, Mass.

391,577. Representation of four tires standing on a road and superimposed thereon the words: **"Adds-Traction to Tire and Road."** Specially prepared liquid for application to rubber articles, particularly to tire casings for increasing traction. Adds-Traction, Inc., Hammond, Ind.

391,583. **"Magic Classics."** Clothing. B. Lowenstein & Bros., Inc., Memphis, Tenn.

391,585. Representation of a heavy bordered square containing the word: **"Benedict's."** Shoes. M. Goldstein, New York, N. Y.



Perkins Battles, of Randolph, Vt., with His "Snow and Mud" Buggy Equipped with Goodrich Used Airplane Tires, Which Carries the Mail, Come High Snow or Deep Mud

391,614. **Furnatex.** Carbon black. Binney & Smith Co., New York, N. Y.

391,631. Representation of a football player and the words: **"Touchdown Spa."** Raincoats. Leon A. Axel, Ltd., New York, N. Y.

391,728. **Young Virginians' Shop.** Shoes and millinery. Thalhimer Bros., Inc., Richmond, Va.

391,730. **Shock-Block.** Automotive parts. Guy & Murton, Inc., Detroit, Mich.

391,741. **So-Niftee.** Footwear. Kreider-Creveling Shoe Co., Boston, Mass.

391,749. **Bulova.** Shoes. E. O. Stolzberg, Boston, Mass.

391,796. **Permobraid.** Elastic fabrics and tapes. American Mills Co. of New York, New Haven, Conn., assignor to United Elastic Corp., Easthampton, Mass.

391,803. **Handy Ann.** Gloves. Wells-Lamont-Smith Corp., Chicago, Ill.

391,817. Representation of a footprint between the words: **"Toe ahead."** Shoes. Gimbel Bros., Inc., New York, N. Y.

391,860. **Winkie.** Chewing gum. General Gum. Inc., Chicago, Ill.

391,882. **Multi-flex.** Automobile radiator hose. United States Rubber Co., New York, N. Y.

391,903. Representation of a diamond containing the word. **"Wataripel."** Sponge rubber. Brown Rubber Co., Inc., La Fayette, Ind.

391,906. **Nu-Pin.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

391,943. **Globex a Peerless Product.** Carbon black. Peerless Carbon Black Co., Pittsburgh, Pa.

392,017. Representation of a rising sun and the word: **"Spunfoam."** Sponge rubber cushions. Sun Rubber Co., Barberton, O.

392,039. **Sealz.** Plastic composition of rubber and other ingredients. Dispersions Process, Inc., New York, N. Y.

392,042. **All-Weather.** Aircraft. Goodyear Aircraft Corp., Wilmington, Del.

392,068. Representation of a circle containing a robin and the words: **"Round Robin Championship."** Golf balls. T. Fazio, Yorktown Heights, N. Y.

392,100. **Sunruco.** Playthings. Sun Rubber Co., Barberton, O.

392,103. Representation of a canteen and the word: **"Canteen."** Shoes. Shoecraft, Inc., New York, N. Y.

392,127. Representation of dancing cartoon figures and the word: **"Springer."** Footwear Springstep, Inc., New York, N. Y.

392,139. **Oilx.** Insulated electric cord. General Electric Co., Schenectady, N. Y.

392,189. **Walkables.** Footwear and shoe findings. Miles Shoes, Inc., New York, N. Y.

392,197. **Sav-A-Mat.** Auto mats. H. S. Towson, Washington, D. C.

392,265. **Cornellian.** Tires and inner tubes. The Pep Boys—Manny, Moe & Jack, Philadelphia, Pa.

392,277. **Fashioned Glove-Fit.** Shoes. I. I. Rubin, New York, N. Y.

392,288. **Reg-Is-Tred Nurse.** Shoes. Associated Merchandising Corp., New York, N. Y.

392,293. **Ruth Barry.** Wearing apparel. Butler Bros., Chicago, Ill.

392,381. **Laxi-Gum.** Chewing gum. P. Colbert, doing business as The Laxi Co., New York, N. Y.

392,423. **Whirl-a-Way.** Tires. Stratton & Terstegge Co., Inc., Louisville, Ky.

392,429. **Vita Crop.** Rubber hydrochloride bags. Goodyear Tire & Rubber Co., Akron, O.

392,567. **Gilmer.** Mechanical goods. L. H. Gilmer Co., Philadelphia, Pa.

392,584. **Raolin.** Chlorinated rubber. Raolin Corp., New York, N. Y.

392,678. **Relio.** Cables. United States Rubber Co., New York, N. Y.

392,720. **Nais-Sance Birth of Fashion by Nuzan.** Wearing apparel. M. Newman, New York, N. Y.

392,729. **Slimderella.** Foundation garments, etc. I. B. Kleinert Rubber Co., New York, N. Y.

392,751. **Kodak.** Rubber gloves and aprons. Eastman Kodak Co., Jersey City, N. J.

392,758. **Model Aces.** Shoes. Model Shoe Co., Cincinnati, O.

392,764. **B Match-ups.** Clothing and shoes. Bloomingdale Bros., Inc., New York, N. Y.

392,765. **Mexi-Coolee.** Shoes. Joyce, Inc., Pasadena, Calif.

392,773. **Selby.** Shoes. Selby Shoe Co., Portsmouth, O.

392,774. **Selby Shoes.** Shoes. Selby Shoe Co., Portsmouth, O.

392,775. **PariSwing.** Suspenders. A. Stein & Co., Chicago, Ill.

392,781. **Securo Flex.** Shoes. J. J. Grover Shoe Co., Boston, Mass.

392,796. Representation of a black circle and two fists stretching two cords, and the word: **"StayLastic."** Elastic fabrics. Continental Elastic Corp., New Bedford, Mass.

392,797. **Rusticlad. Shoes.** Max Lauer, New York, N. Y.

392,799. **Golf-Master.** Shoes. Rasmussen Shoe Co., Westboro, Mass.

392,804. **Chiffon-Lastic.** Foundation garments, etc. Amasia Importing Corp., New York, N. Y.

FINANCIAL

Unless otherwise stated, the results of operations of the following are after all charges, federal income and excess profits taxes and other deductions. Figures in most cases are subject to audit and final year-end adjustments.

Armstrong Rubber Co., West Haven, Conn. Year ended September 30, 1941: net profit, $478,107, equal to $6.32 each on 75,668 shares of A and B stock.

Baldwin Rubber Co., Pontiac, Mich. December quarter, 1941: net income, after all charges including $71,522 provision for federal income tax, $77,257, equal to 24¢ each on 315,254 capital shares, against $208,586, or 66¢ a share, in the 1940 quarter and $101,408, or 32¢ a share, in the quarter ended September 30, 1941. Six months ended December 31, 1941: net income, after tax reserves of $171,931, etc., $178,324, equal to 56¢ a share, against $290,061, or 92¢ a share, in the corresponding period of 1940.

Dayton Rubber Mfg. Co., Dayton, O. Year ended October 31, 1941: net income, $710,291, equal after preferred dividend requirements, to $3.50 each on the 176,671 common shares, against $518,897, or $2.41 a common share, in the preceding 12 months; net sales $11,748,728, against $8,334,054; inventories, $1,821,883, against $439,877.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. For 1941: consolidated net earnings, after charges of $10,000,000 for a special contingency reserve, $90,401,470, equal to $7.50 a share, against $86,945,173, equal to $7.23 a share, with the same special contingency reserve in 1940.

General Tire & Rubber Co., Akron, O. Year ended November 30, 1941: net profit, $1,218,569, equal to $2.05 a common share, against $595,916, or 86¢ a share, in the preceding 12 months; net sales, $37,353,021, the highest on record, against $23,214,314; current assets $13,047,651; current liabilities, $3,594,883. Net earning was considerably reduced by setting aside $700,000 for contingencies and by the adoption of the "last-in, first-out" method of inventory pricing, which reduced net profit about $245,000, according to the report.

Goodyear Tire & Rubber Co., Akron, O., and subsidiaries. For 1941: consolidated net profit, after all charges including a $7,000,000 provision for contingencies, $12,831,397, equal, after preferred dividend requirements, to $4.68 each on 2,059,168 common shares excluding 2,288 in the treasury, contrasted with $10,309,788, or $3.44 a common share after provision of $1,000,000 for contingencies, in 1940; taxes, $26,357,665, against $6,973,015; net sales, $330,599,674, a record high, against $217,540,079; current assets December 31, 1941, $140,199,916, current liabilities, $34,123,109, compared with $120,313,776 and $22,245,745, respectively, a year ago.

Pharis Tire & Rubber Co., Newark, O. Year ended October 31, 1941: net income, $234,633, equal to $1.06 each on 220,000 shares, against $13,812, or 6¢ a share in the year ended October 31, 1940; net sales, $7,626,220, against $5,542,745.

Lee Rubber & Tire Corp., Conshohocken, Pa., and subsidiary. Year ended October 31, 1941: net profit, $1,482,954 equal to $6.14 each on 241,509 shares of $5 par, excluding 31,657 shares in treasury, contrasted with $981,887 after $450,000 inventory reserve, equal to $3.66 each on 268,343 shares, in the preceding 12 months; provision for state and federal income and excess profits taxes, $563,211, against $378,857; consolidated net sales, $19,423,260, against $13,966,711; current assets, $9,249,842 including cash of $3,000,407; current liabilities, $2,339,137; net working capital, $6,910,704. There was a charge of $230,449 made against surplus account to increase reserve for contingencies to $600,000 to provide mainly for contemplated readjustments of operations.

Rome Cable Corp., Rome, N. Y. Fourth quarter, 1941: net profit, $150,059, or 79¢ each on 189,830 shares, against $121,648, or 64¢, in the September quarter and $107,513, or 57¢ a share in the December quarter, 1940. Nine months to December 31: net profit after reserve of $50,000 for contingencies and $608,965 for federal income and excess profits taxes, $392,411, or $2.07 a share, against $268,838, or $1.42 a share, in the corresponding period of 1940, when federal tax deductions were $159,078.

St. Joseph Lead Co., New York, N. Y., and subsidiaries. For 1941: net profit, $4,893,455 after $2,740,699 provision for federal income and excess profits taxes, equal to $2.50 a share, against $5,111,942 after $1,305,670 taxes, or $2.61 a share in 1940.

Seiberling Rubber Co., Akron, O. Year ended October 31, 1941: net income, after provision for all taxes, $813,918, against $219,488; net sales, $13,693,952, against $9,609,826; cash, $748,952.71; total current assets, $4,619,743.87; current liabilities, $1,039,524.13; net worth of the company, $5,619,215.50 against $5,242,250.96 in 1940.

Seiberling Rubber Co. of Canada, Ltd., Toronto, Ont., Canada. Year ended October 31, 1941: net profit, after $137,000 provision for taxes and wartime inventory reserve, $22,270, against $28,216 in the preceding fiscal year.

United Carbon Co., Charleston, W. Va., and subsidiaries. For 1941: net profit, $1,711,547, equal to $4.30 each on 397,885 shares, against $1,336,331, or $3.36 a share, in 1940; the estimated state and federal income and excess profits taxes, $1,145,000, against $725,000.

United Elastic Corp., Easthampton, Mass., and wholly owned subsidiary. For 1941: net profit, $368,959, after a reserve of $200,000 for contingencies, equal to $2.46 a share, against $137,575, or 91¢ a share, in 1940.

United States Rubber Co., New York, N. Y. For 1941: net earnings, after all taxes and charges, $13,662,658, equal, after preferred dividend requirements, to $4.86 each on 1,739,092 common shares, contrasted with $11,425,241, or $3.58 a share, in 1940; consolidated net sales, $315,345,328, a record high and 38% above the 1940 figure; taxes, $18,896,044, against $6,534,593; current assets, $154,814,838, including $29,135,931 in cash and $9,179,040 U. S. Treasury tax anticipation notes; current liabilities, $66,464,919; net working capital, $88,349,919, an increase of $5,804,647 for the year; sinking fund redemptions, $3,120,000, which reduced net outstanding funded indebtedness from $41,067,000 to $37,947,000 for the year; inventories, $76,665,648, up $12,000,000 for the year; net book value of properties, plants, and equipment, $66,953,298; total capital additions, $7,572,104; depreciation, $8,649,919; disposals and adjustments, $1,067,860; estimated war losses, $1,400,000; net valuation of plantations properties, plants, and equipment, $18,873,006.

RECLAIMED RUBBER

FEBRUARY demands for reclaimed rubber continued heavy from all consuming sources except tire manufacturers. Reclaimers are reportedly experiencing some difficulty in obtaining all the scrap they need for present heavy production.

Amendment No. 1 to OPA Price Schedule No. 56 (see page 595), issued February 3 and effective February 5, set a maximum price of 12¢ per pound on red tube reclaimed rubber having a specific gravity of 1.15 to 1.32 in carload lots and 12¼¢ l.c.l. delivered at the purchaser's factory. The amendment permits dropping of cash sales discounts. Prices quoted are established ceilings.

New York Quotations

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	6½/ 6¾
Acid	1.18-1.22	7½/ 7¾
Shoe		
Standard	1.56-1.60	7 / 7¼
Tubes		
Black	1.14-1.26	11¼/11½
Gray	1.15-1.26	12½/13¼
Red	1.15-1.32	12 /12¼
Miscellaneous		
Mechanical blends	1.25-1.50	4½/ 5½
White	1.35-1.50	13½/14½

The above list includes those items or classes only that determine the price bases of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

Market Reviews

CRUDE RUBBER

Commodity Exchange

The board of governors of the Commodity Exchange, Inc., at a special meeting February 6 decided to suspend trading in rubber until further notice, at the close of business on that day. The action was in accordance with Supplementary Order No. M-15-b effective February 1, which prohibited the sale, trade, or transfer of ownership of rubber or latex. A committee was appointed to investigate the 27 open rubber contracts and to hold hearings in order that the manner and the terms of liquidating these contracts may be determined by the board. INDIA RUBBER WORLD will resume publication of rubber market reviews when trading is reestablished.

New York Outside Market

Trading in free rubber was suspended February 2 by reason of new regulations prohibiting the civilian buying and selling of rubber as established in Supplementary Order No. M-15-b.

New York Market Rubber Quotations

	Feb. 25, 1941	Jan. 27, 1942	Feb. 24, 1942
	(Dollars and Cents)		
Latex			
Normal and concentrated (solid content) ....*lb.*	.2532/.2563	.2825/.295	.2825/.295
Paras			
Upriver fine....*lb*	.19¾	.39	.38
Upriver fine....*lb*	*.22	*.45½	*.43½
Upriver coarse..*lb*	.12¾	.20	.22
Upriver coarse..*lb*	*.19	*.38	*.39
Islands fine....*lb.*	.19	.37	.38
Islands fine....*lb.*	*.21½	*.46	*.43
Acre, Bolivian fine .....*lb.*	.20	.39	.38/.39
Acre, Bolivian fine .....*lb.*	*.22½	*.47	*.44
Beni, Bolivian fine .....*lb.*	.19	.39	.39
Madeira fine...*lb.*	.19¾	.38½	.38
Caucho			
Upper ball.....*lb.*	.12½	.20	.22
Upper ball.....*lb.*	*.19	*.38	*.39
Lower ball.....*lb.*	.11¾	.19	.21
Pontianak			
Pressed block..*lb.*	.16½/.24	....	....
Guayule			
Ampar .....*lb.*	.15½	....	....
Africans			
Rio Nuñez ..*lb.*	.18	.20	.20
Black Kassai..*lb.*	.18½	.20	.20
Prime Niger flake .....*lb.*	.22½	.28	.28
Gutta Percha			
Gutta Siak ....*lb*	.17½	....	....
Gutta Soh .....*lb.*	.24	....	....
Red Macassar..*lb.*	1.20	1.50	2.25
Balata			
Block Ciudad Bolivar .....*lb*	.45	....	.60
Manaos block..*lb*	.52	....	.59
Surinam sheets..*lb*	.51	....	.60
Amber .....*lb*	.53	....	.63

* Washed and dried crepe. Shipments from Brazil.

Fixed Government Prices*

Plantation Grades

	Price Per Lb.
No. 1-X R.S.S. in cases†	$0.22½
No. 1 Thin Latex Crepe	.23⅛
No. 2 Thick Latex Crepe	.23⅛
No. 1 Brown Crepe	.21⅜
No. 2 Brown Crepe	.21⅛
No. 2 Amber	.21⅜
No. 3 Amber	.21⅛
Rolled Brown	.17⅛

* For a complete list of government prices see our October 1, 1941, issue, p. 58.

RUBBER SCRAP

MAXIMUM prices at which the principal grades of scrap rubber may be sold to consumers, except for repair, reconditioning, or the manufacture of tire repair materials, were fixed in OPA Price Schedule No. 87, issued February 2 and effective February 5. (See pages 583-584.) Maximum delivered prices for passenger automobile and truck tires are fixed at seven principal reclaiming centers with geographical differentials. The ceiling price at Akron for beadless automobile and truck tires is $24 per short ton. Maximum delivered prices for specialty-grade tires parts and peelings and for inner tubes are uniform for the area east of the Rocky Mountains, with a lower price level for the Los Angeles reclaiming center. The maximum price for red passenger car inner tubes east of the Rocky Mountains is 7½¢ per pound.

Leon Henderson, OPA administrator, stated at the time the schedule was released that scrap prices rose steadily during 1941.

"Nevertheless", he said, "we have used the price level prevailing during October and November, 1941, as a basis in fixing maximum prices and have made minor reductions below this level only on certain specialty-grade tire parts that unquestionably were inflated. Our purpose is to encourage the fullest possible flow of scrap rubber to reclaiming plants at prices consistent with costs of collection and accumulation and with reasonable profits. We now expect dealers at all levels of the scrap market to put forth their maximum efforts to bring in scrap rubber. Hoarding will be dealt with severely."

A provision of the schedule designed to promote incentive for the collection of scrap rubber in areas remote from reclaiming centers permits a reclaimer to pay, in addition to the ceiling price for scrap tires, the amount by which the freight charge to his plant from point of origin exceeds $8 per ton. Dealers may charge consumers set premiums on sales of more than 750 tons of scrap tires, 400 tons of scrap tire parts, or 150 tons of scrap inner tubes, delivery to be made within 60 consecutive days.

L. J. Rosenwald, chief of the Bureau of Industrial Conservation, announced that state salvage committees have been organized in 23 states and the District of Columbia to coordinate public and private activities in collection and disposal of waste materials. Provisions for controlling and punishing violations of price ceilings and hoarding have been made, and the government is checking instances of both that have come to its attention.

Demands for scrap rubber have not abated from previous high levels. The supply is reported to be somewhat tight, but some dealers feel that this condition will be relieved as activity increases during the normal season for scrap collection in the early spring and that a large volume of scrap rubber will appear.

No ceiling prices were placed on scrap boots and shoes, solid tires, mechanicals, and hard rubber. The prices quoted below for inner tubes and pneumatic tires are the established ceilings.

Consumers Buying Prices

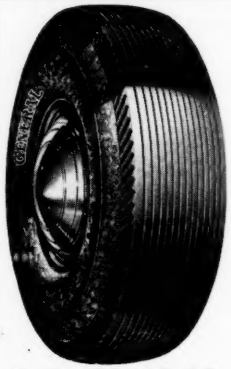
(As of February 19, 1942)

Inner Tubes *†	Prices
No. 2 passenger tubes.....*lb.*	$0.07¾/$0.08
Red passenger tubes .....*lb.*	.07¼/ .07¾
Mixed passenger tubes ....*lb.*	.06¾/ .07
Tires	
Pneumatic Standard*‡	
Mixed passenger tires...*ton*	18.00 /19.00
Beadless passenger tires.*ton*	24.00 /25.50
No. 2 light colored carcass .....*ton*	50.00 /52.50
No. 1 passenger peelings.*ton*	47.50 /50.00
Solid Tires	
Clean mixed truck .....*ton*	46.00 /50.00
Light gravity .....*ton*	55.00 /60.00
Boots and Shoes	
Boots and shoes, black.....*lb.*	.01⅛/ .01⅝
Colored .....*lb.*	.01¼/ .01⅜
Untrimmed arctics .....*lb.*	.01¼/ .01⅜
Mechanicals	
Mixed black scrap.....*ton*	32.00 /35.00
Hose, air brake .....*ton*	32.00 /34.00
Garden, rubber covered.*ton*	12.00 /14.00
Steam and water, soft...*ton*	12.00 /14.00
No. 1 red .....*lb.*	.05¼/ .05¾
No. 2 red .....*lb.*	.04½/ .05
White druggists' sundries ..*lb.*	.04¾/ .05
Mixed mechanicals .....*lb.*	.03 / .03½
White mechanicals .....*lb.*	.04¾/ .05
Hard Rubber	
No. 1 hard rubber .....*lb.*	.16 / .17

*Ceiling prices. High price refers to premiums. †East of Rockies. ‡Akron.

Accelerator Z-51

ACCELERATOR Z-51, a product of Advance Solvents & Chemical Corp., 245 Fifth Ave., New York, N. Y., is a dithiocarbamate-type compound, said to be derived from a base never before utilized for this purpose. In powder form, Z-51 may be milled into dry rubber compounds or dispersed for use in latex mixes. At room or low temperatures it is claimed to be exceptionally fast curing, and at normal press curing temperatures it reportedly behaves like other ultra-accelerators. Exceedingly fast curing compounds can be made with the new accelerator without danger of scorching or bin curing, it is claimed.



The New General Dual 8

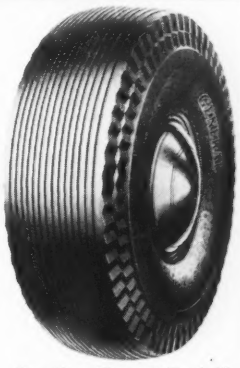
The

GENERAL

TIRE

- goes a long way to make friends

BUILT IN AKRON, OHIO, BY THE GENERAL TIRE & RUBBER CO.



The New General Dual 10

LIQUID LATEX

NORMAL and CONCENTRATED

Agents in North and South America for Dunlop Concentrated 60% Latex, Product of Dunlop Malayan Estates, Ltd.

CHARLES T. WILSON CO., INC.

120 WALL STREET **NEW YORK, N. Y.**

SALES REPRESENTATIVES

BOSTON, Ernest Jacoby & Co., 79 Milk St. AKRON, Charles T. Wilson Co., Inc., 803 United Bldg.

PACIFIC COAST, Reinke, Hiller & Amende, Inc., 1925 E. Olympic Blvd., Los Angeles, Calif.

QUALITY **INTEGRITY** **SERVICE**

61 YEARS WITHOUT REORGANIZATION

BELTING

Transmission—Conveyor—Elevator

HOSE

for every purpose
Water—Fire—Air—Steam

PACKING

Sheet & Rod Packings
for every condition

Mechanical Specialties of Every Description

HOME RUBBER COMPANY

Factory & Main Office
TRENTON, N. J.

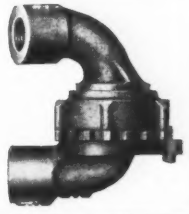
LONDON: 107 Clifton St., Finsbury CHICAGO: 168 North Clinton St. NEW YORK: 80-82 Reade St.

FLEXO

FLEXO JOINTS

Reasonable in price—extremely low maintenance cost

FLEXO SUPPLY COMPANY, 4218 Olive Street, St. Louis



INDIA RUBBER YELLOW

Vulcanizes a Lively Yellow—Hard Rubber Included
Prompt Shipments from Stock—Samples on Request

STANLEY DOGGETT, INC. EST. 1878 75 VARICK ST., NEW YORK

COMPOUNDING INGREDIENTS

A DROP in demand was reported for some compounding ingredients during February; while others held to previous high levels, with sales strictly allocated. Large movements were principally to war industries. Prices are generally firm with many at established ceilings.

CARBON BLACK. Demand generally decreased in February owing to rubber restrictions, but reportedly continued heavy for certain types of semi-reenforcing blacks used in war materials production. Prices are steady.

Sales of carbon black in January dropped to about 21,000,000 pounds, compared with 54,750,000 pounds in December, as a result of heavy December buying against January 1 price increases. Shipments of black in January were approximately 40,000,000 pounds, according to preliminary trade statistics. The U. S. Bureau of Mines reported 1941 record sales of about 543,000,000 pounds, against 457,000,000 pounds in 1940.

CLAYS. It is reported that the curtailed demand reflected the uncertainty of production programs as a result of rubber rationing. Prices are unchanged.

FACTICE OR RUBBER SUBSTITUTE. Demand continued steady. Prices are firm.

LITHARGE. Demand was heavy, with movements holding to good levels. Manufacturers' sales in 1941 were a record 118,600 short tons, an increase of 32% over the 1940 figure of 89,841 tons, the United States Bureau of Mines reported. Prices are steady and unrevised.

LITHOPONE. Movement into consumption remained at a high level, with many producers limiting offers to their regular trade. The Bureau of Mines reported 1941 domestic manufacturers' sales of 173,500 short tons, against 151,802 short tons in 1940. This was a gain of 14% and the largest volume since 1929. OPA Price Schedule No. 80 announced January 29 and effective February 2 set a maximum price of 4.25¢ per pound for the normal grade in bags in carload lots delivered in eastern territory. The ceilings cover six grades with adjustments for less than carload lots and delivery in western territory.

RUBBER CHEMICALS. Demand decreased somewhat from January levels. Prices are firm.

RUBBER SOLVENTS. The call for rubber solvents held to good levels. OPA Price Schedule No. 79, issued January 29 and effective February 2, set maximum prices on carbon tetrachloride. Ceilings range upward from 73¢ per gallon to 50- to 55-gallon drums in carload lots delivered in Zone One to 83¢ per gallon for delivery in Zone Four. Prices of most other solvents are steady.

TITANIUM PIGMENTS. Demand continued heavy with sales strictly allocated. Amendment No. 3 to General Preference Order M-44 of the WPB, issued January 28 and effective February 1, increased the amount of titanium dioxide which producers must set aside for direct allocation by the Division of Industry Operations from 20 to 25%. Effective March 1, OPA Price Schedule No. 98, issued February 6, set a maximum price on titanium dioxide at 14.5¢ per pound for the regular grade in bags in lots of 20 tons or more delivered in the eastern territory. Additional charges are permitted for lesser quantities with adjustments for deliveries in the western territory and for export sales. The new prices are those prevailing October 1, 1941.

ZINC OXIDE. Orders for lead-free zinc oxide by the rubber industry engaged in war production were heavy, with sales allocated. The Bureau of Mines reported that 1941 sales of 149,100 short tons of lead-free zinc oxide were 32% above the 1940 figure of 113,213 short tons. Sales of leaded zinc oxide in 1941 were 52% above 1940 sales. Supplementary Order No. M-11-h of the WPB, issued January 31, set the February zinc oxide pool at 20% of the producer's November, 1941, production of lead-free zinc oxide. The January requirement was 10% of October, 1941, production. Prices are firm.

Current Quotations*

Abrasives			
Pumicestone, powdered	lb.	$0.035	$0.04
Rottenstone, domestic	lb.	.025	
Accelerators, Inorganic			
Lime, hydrated, *l.c.l.*, New York	ton	25.00	
Litharge (commercial)	lb.	.09	
Magnesia, calcined, heavy	lb.		
technical, light	lb.	.0625/	.07
Accelerators, Organic			
A-1	lb.	.26 /	.35
A-10	lb.	.36 /	.42
A-19	lb.	.52 /	.65
A-32	lb.	.60 /	.70
A-77	lb.	.42 /	.55
A-100	lb.	.42 /	.55
Accelerator 49	lb.		
808	lb.	.60 /	.62
833	lb.	1.15	
Acrin	lb.	.65	
Aldehyde ammonia	lb.	.65 /	.70
Altax	lb.	.55 /	.60
B-J-F	lb.	.50 /	.55
Beutene	lb.	.60 /	.65
Butyl Eight	lb.	.98 /	1.00
C-P-B	lb.	2.00	
Captax	lb.	.50	
D-B-A	lb.	2.00	
Delac A	lb.	.40 /	.50
O	lb.	.40 /	.50
P	lb.	.40 /	.50
Di-Esterex-N	lb.	.60 /	.70
DOTG (Di-ortho-tolyguanidine)	lb.	.44 /	.46
DPG (Diphenylguanidine)	lb.	.36 /	.36
El-Sixty	lb.	.50 /	.65
Ethylideneaniline	lb.	.42 /	.43
Formaldehyde P.A.C	lb.	.06 /	.0625
Formaldehyde-para-toluidine	lb.	.65	
Formaniline	lb.	.36 /	.37
Guantal	lb.	.40 /	.50
Hepteen	lb.	.35 /	.40
Base	lb.	1.35 /	1.50
Hexamethylenetetramine U.S.P.	lb.	.39	
Technical	lb.	.33	
Lead oleate, No. 999	lb.	.145	
Witco	lb.	.15	
Ledate	lb.	1.5¢	
Methazate	lb.	1.25	
Monex	lb.	1.55	
Morfex "33"	lb.	.76 /	.79
"55"	lb.	1.03 /	1.05
O-X-A-F	lb.	.50 /	.55
Oxynone	lb.	.77 /	.90
Para-nitroso-dimethylaniline	lb.	.85	
Pentex	lb.	.75 /	.85
Flour	lb.	.125 /	.135
O	lb.		
Flour	lb.		
Phenex	lb.	$0.50	/$0.55
Pip-Pip	lb.	1.65	
R & H 50-D	lb.	.42 /	.43
Rotax	lb.	.60 /	.65
Safex	lb.	1.20 /	1.30
Santocure	lb.	.80 /	1.00
Selenac	lb.	2.00	
SPDX	lb.	.70 /	.75
A	lb.	.70 /	.75
Super sulphur No. 2	lb.	.14 /	.16
Tetrone A	lb.	2.20	
Thiocarbanilide	lb.	.28 /	.33
Thionex	lb.	1.55	
Thiurad	lb.	1.55	
Trimene	lb.	.55 /	.65
Base	lb.	1.05 /	1.20
Triphenylguanidine (TPG)	lb.	.45	
Tuads, Methyl	lb.	1.55	
2-MT	lb.	.75	
Ulto	lb.	1.00 /	1.05
Ureka	lb.	.60 /	.75
Blend B	lb.	.60 /	.75
C	lb.	.56 /	.65
Vulcanex	lb.	.42 /	.43
Z-B-X	lb.	2.50	
Zenite	lb.	.46 /	.48
A	lb.	.53 /	.55
B	lb.	.46 /	.48
Zimate, Butyl	lb.	1.15	
Ethyl	lb.	1.15	
Methyl	lb.	1.25	
Zipacel	lb.	1.90	
Activators			
Aero Ac 50	lb.		
Barak	lb.	.50	
MODX	lb.	.30 /	.35
SL No. 20	lb.	.11 /	.115
Age Resisters			
AgeRite Alba	lb.	2.00	
Gel	lb.	.57 /	.59
Hipar	lb.	.65 /	.67
Powder	lb.	.52 /	.54
Resin	lb.	.52 /	.54
D	lb.	.52 /	.54
White	lb.	1.25 /	1.40
Albasan	lb.	.70 /	.75
Aminox	lb.	.52 /	.61
Antox	lb.	.56	
Betanox	lb.	.52 /	.61
B-L-E	lb.	.52 /	.61
Powder	lb.	.65 /	.74
B-X-A	lb.	.52 /	.61
Copper Inhibitor X-872-A	lb.	1.15	
Flectol H	lb.	.52 /	.65
White	lb.	.90 /	1.15
M-U-F	lb.	1.50	
Neozone (standard)	lb.	.63	
A	lb.	.52 /	.54
C	lb.	.52 /	.54
D	lb.	.52 /	.54
E	lb.	.63	
Oxynone	lb.	.77 /	.90
Permalux	lb.	1.20	
Santoflex B	lb.	.52 /	65
BX	lb.	.58 /	.71
Santovar A	lb.	1.15 /	1.40
Stabilite	lb.	.52 /	.54
Alba	lb.	.70 /	.75
Thermoflex A	lb.	.65 /	.67
C	lb.	.58 /	.60
Tysonite	lb.	.16 /	.165
V-G-B	lb.	.52 /	.61
Alkalies			
Caustic soda, flake, Columbia (400-*lb. drums*)	100 lbs.	2.70 /	3.55
liquid, 50%	100 lbs.	1.95	
solid (700-*lb. drums*)	100 lbs.	2.30 /	3.15
Antiscorch Materials			
Antiscorch T	lb.	.90	
Cumar RH	lb.	.105	
E-S-E-N	lb.	.35 /	.40
R-17 Resin (*drums*)	lb.	.1075	
RM	lb.	1.25	
Retarder W	lb.	.36	
Retardex	lb.	.45 /	.48
U-T-B	lb.	.35 /	.40
Antisun Materials			
Heliozone	lb.	.23 /	.24
S.C.R.	lb.	.33 /	.35
Sunproof	lb.	.23 /	.28
Jr.	lb.	.165 /	.215
Blowing Agents			
Ammonium Carbonate, lumps (500-*lb. drums*)	lb.		
Unicel	lb.	.50	
Brake Lining Saturant			
B.R.T. No. 3	lb.	.0175/	.0185
Colors			
Black			
Du Pont powder	lb.	.42	
Lampblack (commercial), *l.c.l.*	lb.	.15	
Blue			
Du Pont Dispersed	lb.	.35 /	3.95
Powders	lb.	2.25 /	3.75
Heliogen BKA	lb.		
Toners	lb.		

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of known ingredients. Requests for information not recorded will receive prompt attention.

Brown
Mapico ..... lb. $0.11

Green
Chrome ..... lb. .25
oxide (*freight allowed*) ... lb. .24
Du Pont Dispersed ..... lb. .98 /$2.85
Powders ..... lb. 1.00
Guignet's (*bbls.*) ..... .70
Toners ..... lb.

Orange
Du Pont Dispersed ..... lb. .88 / 2.35
Powders ..... lb. 2.75 / 3.05
Toners ..... lb.

Orchid
Toners ..... lb.

Pink
Toners ..... lb.

Purple
Toners ..... lb.

Red
Antimony
Crimson, 15/17% ..... lb.
R. M. P. No. 3 ..... lb. .48
Sulphur free ..... lb.
R.M.P. ..... .52
Golden 15/17% ..... lb.
7-A ..... lb. .37
Z-2 ..... lb. .25
Cadmium, light (400-*lb. bbls.*) ..... lb. .80 / .85
Du Pont Dispersed ..... lb. .93 / 2.05
Powders ..... lb. .60 / 1.65
Iron Oxide, *l.c.l.* ..... lb.
Mapico ..... lb. .0975
Rub-Er-Red (*bbls.*) ..... lb. .0975
Toners ..... lb.

White
Lithopone (*bags*) ..... lb. .0425 /.045
Albalith ..... lb. .0425/ .045
Astrolith (50-*lb. bags*) ... lb. .0425/ .045
Azolith ..... lb. .0425/ .045
Titanium Pigments
Ray-bar ..... lb. .055 / .065
Ray-cal ..... lb. .0525/ .0625
Rayox ..... lb. .135 / .165
Titanofith (50-*lb. bags*) ... lb. .056 / .0585
Titanox-A ..... lb. .145 / .175
B ..... lb. .0575/ .0625
30 ..... lb. .0575/ .0625
C ..... lb. .055 / .06
M ..... lb. .0575/ .0625
RC ..... lb. .055 / .06
RC-HT ..... lb. .055 / .06
Ti-Tone ..... lb.
Zopaque (50-*lb. bags*) ... lb. .16 / .165
Zinc Oxide
Azo ZZZ-11 ..... lb. .0725/ .075
44 ..... lb. .0725/ .075
55 ..... lb. .0725/ .075
66 ..... lb. .095 / .0975
French Process, Florence
Green Seal-8 ..... lb. .09 / .0925
Red Seal-9 ..... lb. .085 / .0875
White Seal-7 ..... lb. .095 / .0975
Kadox, Black Label-15. .. lb. .0725/ .075
No. 25 ..... lb. .085 / .0875
72 ..... lb. .0725/ .075
Red Label-17 ..... lb. .0725/ .075
Horse Head Special 3 ... lb. .0725/ .075
XX Red-4 ..... lb. .0725/ .075
23 ..... lb. .0725/ .075
72 ..... lb. .0725/ .075
78 ..... lb. .0725/ .075
80 ..... lb. .0725/ .075
103 ..... lb. .0725/ .075
110 ..... lb .0725/ .075
St. Joe (lead free)
Black Label ..... lb. .0725/ .075
Green Label ..... lb. .0725/ .075
Red Label ..... lb. .0725/ .075
U.S.P. ..... lb. .105 / .1075
Zinc Sulphide Pigments
Cryptone-BA-19 ..... lb. .056 / .0585
BT ..... lb. .056 / .0585
CB ..... lb. .056 / .0585
MS ..... lb. .0575/ .06
ZS No. 20 ..... lb. .0825/ .085
86 ..... lb. .0825/ .085
230 ..... lb. .0825/ .085
800 ..... lb. .0825/ .085
Sunolith ..... lb. .0425/ .045

Yellow
Cadmolith (cadmium yellow), (400-*lb. bbls.*) ..... lb. .55 / .60
Du Pont Dispersed ..... lb. 1.25 / 1.85
Powders ..... lb. .70 / 1.75
Mapico ..... lb. .0725
Toners ..... lb.

Dispersing Agents

Bardex ..... lb. .0425/ .045
Bardol ..... lb. .025 / .0275
B ..... lb. .05 / .0525
Darvan No. 1 ..... lb. .30 / .34
No. 2 ..... lb. .30 / .34
Nevoil (*drums, c.l.*) ..... lb. .0225
Santomerse S ..... lb. .11 / .25

Extenders

Naftolen ..... lb. $0.15 /$0.20

Fillers, Inert

Asbestine, *c.l.* ..... ton 15.00
Asbestos Fiber ..... ton 15.50 /48.00
Barytes ..... ton 40.00
f.o.b., St. Louis (50-*lb. paper bags*) ..... ton 25.55
off color, domestic ..... ton 29.00
white, domestic ..... ton 38.50
Blanc fixe, dry, precip. ..... lb. .065
Calcene ..... ton 37.50 /43.00
Infusorial earth ..... lb. .0225
Kalite No. 1 ..... ton 26.00
3 ..... ton 36.00
Kalvan ton100.00
Magnesium Carbonate, *l.c.l.* .. lb. .0725/ .1125
Paradene No. 2 (*drums*) .... lb. .0525
Pyrax A ..... ton 7.50
Whiting
Columbia Filler ..... ton 9.00 /14.00
Suprex White ..... ton 32.50
Witco, *c.l.* ..... ton 8.00

Finishes

Black-Out (surface protective) ..... gal. 4.50 / 5.00
Mica, *l.c.l.* ..... ton
Rubber lacquer, clear ..... gal. 1.00 / 2.00
colored ..... gal. 2.00 / 3.50
Shoe varnish ..... gal. 1.45
Talc ..... ton 25.00

Flock

Cotton flock, dark ..... lb. .09 / .11
dyed ..... lb. .40 / .80
white ..... lb. .12 / .20
Rayon flock, colored ..... lb. 1.00 / 1.50
white ..... lb. .75 / 1.00

Latex Compounding Ingredients

Accelerator 552 ..... lb. 1.65
Aerosol OT Aqueous 10% .. lb.
Antox, dispersed ..... lb. .54
Aquarex D ..... lb. .75
F ..... lb. .85
MDL Paste ..... lb. .25
Areskap No. 50 ..... lb. .18 / .24
100, dry ..... lb. .39 / .51
Aresket No. 240 ..... lb. .16 / .22
300, dry ..... lb. .42 / .50
Aresklene No. 375 ..... lb. .35 / .50
400, dry ..... lb. .51 / .65
Black No. 25, dispersed ..... lb. .22 / .40
Casein ..... lb.
Collocarb ..... lb. .07
Color Pastes, dispersed ..... lb. .75 / 1.10
Copper Inhibitor X-872 ..... lb. 2.25
Dispersex No. 15 ..... lb. .11 / .12
No. 20 ..... lb. .08 / .10
Factex Dispersion A ..... lb. .165
Heliozone, dispersed ..... lb. .25
MICRONEX, Colloidal .... lb. .06 / 07
R-2 Crystals ..... lb. 2.50 / 2.75
RN-2 Crystals ..... lb. 1.90 / 2.15
S-1 (400-*lb. drums*) ..... lb. .65
Santobrite Briquettes ..... lb.
Powder ..... lb.
Santomerse D ..... lb. .41 / .65
S ..... lb. .11 / .25
Sodium Stearate ..... lb. .34 / .375
Stablex A ..... lb. .90 / 1.10
B ..... lb. .65 / .90
C ..... lb. .40 / .50
Sulphur, dispersed ..... lb. .10 / .15
No. 2 ..... lb. .08 / .12
T-1 (440-*lb. drums*) ..... lb. .40
Tepidone ..... lb. .63
Tetrone A ..... lb. 2.20
Zenite Special ..... lb. .33
Zinc oxide, dispersed ..... lb. .12 / .15

Mineral Rubber

Black Diamond, *l.c.* ..... ton 25.00 /27.00
B.R.C. No. 20 ..... lb. .0105/ .0115
Hydrocarbon, Hard ..... lb. 25.00 /27.00
Parmr ..... ton 25.00 /29.00
Pioneer, *c.l.* ..... lb. 25.00 /27.00
285°-300° ..... ton 25.00 /27.00

Mold Lubricants

Aluminum Stearate ..... lb. .21 / .24
Aquarex D ..... lb. .75
MDL Paste ..... lb. .25
Colite ..... gal. .90 / 1.15
Lubrex ..... lb. .25 / .30
Mold Paste ..... lb. .12 / .30
Rubber-Glo, conc. regular .. gal. .94 / 1.15
Type W ..... gal. .99 / 1.20
Sericite ..... ton 65.00
Soapstone, *l.c.l.* ..... ton 22.50
Zinc Stearate ..... lb. .28 - / .31

Oil Resistant

A-X-F ..... lb. .82 / .85

Reclaiming Oils

B.R.V ..... lb. .035 / .0375
C-10 ..... gal. .19 / .24
D-4 ..... gal. .17 / .22
E-5 ..... gal. .15 / .20
No. 1621 ..... lb. .021 / .0235
S.R.O. ..... lb. .02 / .0225
Type C (for synthetic rubber) ..... gal. $0.33 /$0.38
X-159 ..... gal. .20 / .32

Reenforcers

Carbon Black
Aerfloted Arrow Specification (*bags only*) ..... lb. .0355†
Arrow Compact Granulized ..... lb. .0355†
Certified Heavy Compressed (*bags only*) .. lb. .0355†
Spheron ..... lb. .0355†
Continental, dustless .... lb. .0355†
Compressed (*bags only*) . lb. .0355†
Disperso ..... lb. .0355†
Dixie ..... lb. .0355†
Dixiedensed ..... lb. .0355†
66 ..... lb. .0355†
Furnex ..... lb. .035
Beads ..... lb. .035
Gastex ..... lb. .035 / .06
HX ..... lb. .0355†
Kosmobile ..... lb. .0355†
66 ..... lb. .0355†
Kosmos ..... lb. .0355†
Dixie 20 ..... lb. .035†
MICRONEX Beads ..... lb. .0355†
Mark II ..... lb. .0355
Standard ..... lb. .0355
W-5 ..... lb. .0355
W-6 ..... lb. .0355
P-33 ..... lb. .0475
Pelletex ..... lb. .035 / .06
Thermax ..... lb. .0225
"S" ..... lb. .075 / .10
TX ..... lb. .0355†
Velvetex ..... lb. .04 / .06
"WYEX BLACK" ..... lb. .0355†
Carbonex Flakes ..... lb. .03 / .035
S ..... lb. .031 / .036
Plastic ..... lb. .031 / .0335
Clays
Aerfloted Hi-White ..... ton 11.00 /
LGB ..... ton 15.00
Paragon (50-*lb. bags*) .. ton 10.00
Suprex (50-*lb. bags*) .. ton 11.00 /23.50
Catalpo, *c.l.* ..... ton 30.00
China ..... ton 25.00
Crown ..... ton 11.00
Dixie ..... ton 11.00
"L" ..... ton
Langford ..... ton 8.50
McNamee ..... ton 10.00
Par ..... ton 11.00
Paraforce, *c.l.* ..... ton 50.00
Witco, *c.l.* ..... ton 10.00
Cumar EX ..... lb. .05
MH ..... lb. .065 / .115
V ..... lb. .095 / .125
Silene ..... lb. .04 / .045

Reodorants

Amora A ..... lb.
B ..... lb.
C ..... lb.
D ..... lb.
Curodex 19 ..... lb.
188 ..... lb.
198 ..... lb.
Rodo No. 0 ..... lb. 4.00 / 4.50
10 ..... lb. 5.00 / 5.50

Rubber Substitutes

Black ..... lb. .085 / .13
Brown ..... lb. .085 / .1375
White ..... lb. .09 / .15
Factice
Amberex Type B. ..... lb. .1875
Brown ..... lb. .085 / .14
Fac-Cel B ..... lb. .155
C ..... lb. .155
Neophax A ..... lb. .14
B ..... lb. .14
White ..... lb. .09 / .15

Softeners and Plasticizers

B.R.T. No. 7 ..... lb. .02 / .021
Bondogen ..... lb. .98 / 1.05
Burgundy pitch ..... lb.
Copene Resin ..... lb. .32
Cycline oil ..... gal. .14 / .20
Dipolymer Oil ..... gal. .33 / .38
Dispersing Oil No. 10. ..... lb. .0375/ .04
Nevinol ..... lb. .13 / .14
Nuba resinous pitch (*drums*)
Grades No. 1 and No. 2 .. lb. .029
3-X ..... lb. .0425
Nypene Resin ..... lb. .32
Palm oil (Witco), *c.l.* ..... lb.
Palmol ..... lb. .16
Para Flux ..... gal. .18 / .19
No. 2016 ..... gal. .20
Para Lube ..... lb. .045 / .048
Piccolyte Resins ..... lb. .15 / .18
Piccoumaron Resins ..... lb. .045 / .15
Pine tar ..... gal.
Oil ..... gal.
Plastogen ..... lb. .0775/ .08
Plastone ..... lb. .27 / .30
R-19 Resin (*drums*) ..... lb. .1075
21 Resin (*drums*) ..... lb. .1075

†Price quoted is f.o.b. works (bags). The price f.o.b. works (bulk) is $0.033 per pound. All prices are carlot.

Reogen	lb.	$0.115	/$0.12
RPA No. 2	lb.	.65	
3	lb.	.46	
4	lb.	.80	
Tackol	lb.	.085 /	.18
Tonox	lb.	.52 /	.61
Witco No. 20, *l.c.l.*	gal.	.20	
X-1 resinous oil (*tank car*)	lb.	.011	

Softeners for Hard Rubber Compounding

Resin C Pitch 45°C. M.P.	lb.	.015 /	.016
60°C. M.P.	lb.	.015 /	.016
75°C. M.P.	lb.	.015 /	.016

Solvents

Beta-Trichlorethane	lb.	.20	
Carbon Bisulphide	lb.		
Tetrachloride	gal.		
Cosol No. 1	gal.	.26	
No. 2	gal.	.25	
No. 3	gal.	.22	
Industrial 90% benzol (*tank car*)	gal.	.15	
Pisco	gal.	.22 /	.32
Skellysolve	gal.		

Stabilizers for Cure

Barium Stearate	lb.	.27 /	.30
Calcium Stearate	lb.	.23 /	.27
Laurex (*bags*)	lb.	.15 /	.175
Lead Stearate	lb.		
Magnesium Stearate	lb.	.29 /	.32
Stearex B	lb.	.15 /	.16
Beads	lb.	.145 /	.155
Stearic acid, single pressed	lb.	.15 /	.16
Stearite, *c.l.*	lb.	.145	
Zinc Laurate	lb.	.29 /	.32
Stearate	lb.	.28 /	.31

Synthetic Rubber

Hycar O. R.	lb.	.70	/ 1.00
Neoprene Latex Type 56	lb.	.30	
57	lb.	.30	
60	lb.	.36	
Neoprene Type CG	lb.	.70	
E	lb.	.65	
FR	lb.	.75	
G	lb.	.70	
GN	lb.	.65	
I	lb.	.70	
KN	lb.	.75	
M	lb.	.65	
Synthetic 100	lb.	.41	
"Thiokol" Type "A"	lb.	.35 /	.45
"F"	lb.	.45 /	.55
"FA"	lb.	.50 /	.60
"RD"	lb.	.70	

Tackifier

B.R.H. No. 2	lb.	.02 /	.021

Vulcanizing Ingredients

Magnesia, light (for neoprene)	lb.	.25 /	.26
Sulphur	100 lbs.		
Chloride (*drums*)	lb.	.04	
Telloy	lb.	1.75	
Vandex	lb.	1.75	
(See also Colors—Antimony)			

Waxes

736 (clear)	gal.	1.25	
737 (black)	gal.	1.35	
1515-A (black)	gal.	1.35	
Carnauba, No. 3 chalky	lb.		
2 N.C.	lb.		
3 N.C.	lb.		
1 Yellow	lb.		
2	lb.	.51 /	.61
Carnube	lb.	.12 /	.17
Monten			
Rubber Wax No. 118, Neutral	gal.	.67 /	1.22
Colors	gal.	.77 /	1.32

New Incorporations

Simplex Rubber Co., Inc., Kings County, N. Y. Capital 100 shares, no par value. J. L. Stoll, 2 Lafayette St., New York, N. Y. Rubber.

Startex Co., Inc., New York. Capital 100 shares, no par value. H. Craske, 70 Pine St., New York, N. Y. Artificial rubber.

State Coated Fabrics, Inc., New York. Capital $20,000. H. Youran, 299 Broadway, New York, N. Y. Rubber coated fabrics.

Weber & Rothschild, Inc., New York. Capital $25,000. Michaelson & Bernknopf, 163-18 Jamaica Ave., Jamaica, N. Y. Deal in crude rubber and gums.

Rims Approved and Branded by Tire & Rim Association

Rim Size	1940	1941
Passenger Car Rims		
15" and 16" Drop Center (See Table of Not Branded Rims at End)		
16x3.50D	229,129	133,163
16x4.00E	7,058,735	5,961,120
16x4.25E	559,796	8,197
15x4.50E	131,597	8,738
16x4.50E	3,396,007	3,261,990
15x5.00E	173,772	453,208
16x5.00E	514,203	684,661
15x5.00F	204,471	82,775
16x5.00F	1,504,209	1,105,136
15x5.50F	371,739	878,605
16x5.50F	35,890	52,417
16x6.00F	16,665	34,297
16x4.00E "Hump"	.....	2,811,094
16x4.25E "Hump"	.....	813,942
16x4.50E "Hump"	.....	24,221
15x5.00F "Hump"	.....	79,466
15x5.50F "Hump"	.....	12,411
15x6-L	.....	218,876
16x6-L	.....	332,726
15x6½-L	.....	63,638
16x6½-L	.....	1,009
15" and 16" Drop Center—Low Flange		
All Sizes	1,166	.....
17" and Over Drop Center		
All Sizes	116,067	121,885
Flat Base for Balloon Tires		
All Sizes	5,345	.....
Clincher		
All Sizes	2,908	3,297
Truck and Bus Rims		
Flat Base		
15x3.75P (5")	.....	8,402
17x3.75P (5")	45,607	47,662
18x3.75P (5")	9,388	3,574
20x3.75P (5")	521,842	566,679
17x4.33R (6")	114,501	133,868
18x4.33R (6")	3,437	2,560
20x4.33R (6")	1,345,834	1,697,765
24x4.33R (6")	12,491	19,382
15x5.00S (7")	8,280	2,580
17x5.00S (7")	382	156
18x5.00S (7")	13,292	20,504
20x5.00S (7")	1,005,639	2,519,616
22x5.00S (7")	143	.....
24x5.00S (7")	5,751	6,751
15x6.00T (8")	3,633	11,526
18x6.00T (8")	98,386	43,358
20x6.00T (8")	301,066	568,614
20x6.00CT	.....	450
24x6.00T (8")	22,090	48,943
24x6.00T (8")	6,383	5,127
15x7.33V (9/10")	46	38
18x7.33V (9/10")	3,455	6,467
22x7.33V (9/10")	40,880	152,785
22x7.33V (9/10")	13,450	17,604
24x7.33V (9/10")	19,590	20,880
19x8.37V (11")	5,515	3,063
20x8.37V (11")	4,648	10,132
24x8.37V (11")	3,724	13,148
24x10.00W	.....	1,273
Semi-Drop Center for Light Trucks		
16x4.50E	46,588	78,311
15x5.50F	1,198	9,633
16x5.50F	200,077	417,874
Agricultural Rims		
Drop Center and Semi-Drop Center		
12x2.50C	8,222	24,100
15x2.50C	160	2,007
18x2.50C	5,188	2,393
12x3.00D	24,136	45,077
15x3.00D	201,164	272,500
16x3.00D	42,815	39,883
18x3.00D	2,163	5,441
19x3.00D	66,273	99,780
21x3.00D	9,905	26,501
24x3.00D	814	1,875
30x3.00D	977	700
36x3.00D	2,098	5,317
40x3.00D	590	.....
17x3.25E	.....	1,508
18x3.25E	2,204	5,703
19x3.25E	.....	4,883
21x3.25E	6,287	12,089
18x4.00E	5,762	.....
28x4.00E	.....	475
18x4.19F	773	5,518
20x4.50E	10,586	14,530
22x4.50E	8,771	10,921
24x4.50E	.....	114
36x4.50E	3,097	4,275
13x5.50F	13,412	7,856
18x5.50F	19,880	46,748
20x5.50F	12,333	53,654
36x5.50F	.....	340
20x5.50R	1,343	.....
24x5.50R	6,154	14,339
32x5.50R	96	595
36x5.50R	830	1,121
40x5.50R	1,126	1,629
24x6.00S	8,961	9,856
28x6.00S	1,320	789
36x6.00S	20,001	11,294
40x6.00S	6,593	2,499
20x8.00T	2,858	3,426

Rim Size	1940	1941
Agricultural Rims—(*Continued*)		
24x8.00T	47,561	62,057
28x8.00T	26,831	13,720
32x8.00T	9,799	6,587
36x8.00T	31,164	9,764
40x8.00T	1,757	1,404
42x8.00T	173	140
44x8.00T	.....	116
W4-30	.....	106
W4-40	462	.....
W4-44	151	.....
W4.5-40	1,075	1,821
W4.5-44	120	.....
W5-40	321	.....
W5-44	399	601
W6-28	637	.....
W6-32	12,801	580
W6-36	500	.....
W6-44	1,957	990
W7-24	33,022	27,790
W7-32	27,013	38,563
W7-36	3,200	16,289
W7-38	5,789	2,021
W7-44	.....	5,918
W8-24	73,994	104,917
W8-28	2,313	5,887
W8-32	7,386	16,976
W8-36	4,628	15,332
W8-38	19,692	28,692
W8-40	3,627	7,417
W9-24	547	9,419
W9-28	6,921	1,911
W9-36	4,200	20,247
W9-38	13,565	15,598
W9-40	187	967
W10-24	358	2,454
W10-26	456	1,127
W10-28	21,661	39,655
W10-36	12,672	55,031
W10-38	1,756	2,500
W10-40	4,158	13,745
W11-24	993	6,499
W11-26	421	1,133
W11-28	408	1,872
W11-30	.....	573
W11-32	465	382
W11-36	.....	1,313
DW7-38	1,809	1,679
DW8-38	18,374	42,908
DW8-40	.....	139
DW9-26	674	2,322
DW9-36	1,574	.....
DW9-38	53,063	111,376
DW10-24	.....	1,079
DW10-26	2,136	2,675
DW10-28	2,331	1,260
DW10-36	1,049	4,758
DW10-38	23,704	56,313
DW11-24	473	6,884
DW11-26	350	3,330
DW11-28	3,529	14,962
DW11-30	374	306
DW11-32	908	8,287
DW11-36	2,303	8,106
DW11-38	5,263	15,354
DW12-30	3,353	10,394
DW12-34	.....	2,107
Cast Rims		
10x5.00F	968	42
10x6.00F	608	281
24x10.00	16	.....
20x11.25	2	30
24x11.25	15	116
32x11.25	.....	8
24x13.00	773	846
24x15.00	827	1,153
40x15.00	112	36
32x17.00	10	.....
32x18.00	36	81
Airplane Rims		
All sizes	2,437	2,788
Totals	19,378,558	25,193,698
"Hump Bead Seat" Rims Inspected but Not Branded (Not Listed Above)		
Passenger Car Rims—15" and 16" Drop Center		
16x4.00E	1,972,182	523,562
16x4.25E	444,206	145,323
16x4.50E	8,620	2,550
15x5.00F	.....	10,687
15x5.50F	90,085	.....
Totals	2,515,093	682,122

Kalvan "S"

Kalvan "S" is a dual-purpose filler and processing agent developed for white or light colored butadiene-type synthetic rubber compounds. It is dustless, is rapidly incorporated into the synthetic, and imparts smooth tubing and calendering properties, according to claims. It reportedly will not discolor light colored stocks. Kalvan "S", offered by R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y., contains about 20% of plasticizer.

For **A BETTER LOOKING PRODUCT**

For **MORE CURES PER MOLD CLEANING**

REPLACE FATTY ACIDS

WITH PARA LUBE + SL-20
(EQUAL PARTS)

Equal parts of Para Lube and SL-20 is a C. P. Hall development that does the job of fatty acids ***better*** and ***more economically.***

Such a significant improvement in the manufacture of molded rubber products surely deserves your attention.

The C. P. Hall Company invites you to test this formula in your own plant or laboratory. See how PARA LUBE + SL-20 cuts costs . . . insures cleaner and quicker knockout . . . gives maximum number of cures per mold cleaning!

The C. P. Hall Co.
CHEMICAL MANUFACTURERS
AKRON • BOSTON • LOS ANGELES • CHICAGO

Regular and Special Constructions of

COTTON FABRICS

Single Filling **Double Filling**
and

ARMY
Ducks

HOSE and BELTING
Ducks

Drills

Selected
Osnaburgs

Curran & Barry
320 BROADWAY
NEW YORK

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Dec. 27	Jan. 31	Feb. 7	Feb. 14	Feb. 21
Feb.	.....	18.46	18.35	.....	.....
Mar.	16.96	18.55	18.44	18.45	18.37
July	17.16	18.76	18.70	18.72	18.69
Sept.	17.17	18.72	18.74	18.80	18.75
Dec.	.....	18.71	18.85	18.89	18.83
Jan.	.....	18.75	18.91	18.93	18.85

New York Quotations

February 20, 1942

Drills

38-inch 2.00-yard	yd.	....
40-inch 3.47-yard	....	....
50-inch 1.52-yard		$0.31
52-inch 1.85-yard		.25⅝
52-inch 1.90-yard		.24⅝/.25
52-inch 2.20-yard		.21¼
52-inch 2.50-yard		.19⅝
59-inch 1.85-yard		.25

Ducks

38-inch 2.00-yard D. F.	yd.	.22½/.23
40-inch 1.45-yard S. F.		.30⅝
51¼-inch 1.35-yard D. F.		.33⅜
72-inch 1.05-yard D. F.		.45¼/.50
72-inch 17-21 ounce		.57

Mechanicals

Hose and belting	lb.	.48½

Tennis

51½-inch 1.35-yard	yd.	.33¼
51½-inch 1.60-yard	yd.	.28¾
51½-inch 1.90-yard	yd.	.24½

Hollands—White

Blue Seal

20-inch	yd.	....
30-inch		....
40-inch		....

Gold Seal

20-inch No. 72	yd.	....
30-inch No. 72		....
40-inch No. 72		....

Red Seal

20-inch	yd.	....
30-inch		....
40-inch		....

Osnaburgs

40-inch 2.34-yard	yd.	.15⅝
40-inch 2.48-yard		.14¾
40-inch 2.56-yard		.13992
40-inch 3.00-yard		.12⅜
40-inch 7-ounce part waste		.15
40-inch 10-ounce part waste		.21⅛
37-inch 2.42-yard clean		.15

Raincoat Fabrics

Cotton

Bombazine 64 x 60	yd.	....
Plaids 60 x 48		....
Surface prints 64 x 60		....
Print cloth, 38½-inch, 64 x 60		.08691

Sheetings, 40-Inch

48 x 48, 2.50-yard	yd.	.15600
64 x 68, 3.15-yard		.13492
56 x 60, 3.60-yard		.11528
44 x 40, 4.25-yard		.09412

Sheetings, 36-Inch

48 x 48, 5.00-yard	yd.	.08300
44 x 40, 6.15-yard		.06748

Tire Fabrics

Builder

17¼ ounce 60" 23/11 ply Karded peeler	lb.	.45

Chafer

14 ounce 60" 20/8 ply Karded peeler	lb.	.45
9¾ ounce 60" 10/2 ply Karded peeler	lb.	.45

Cord Fabrics

23/5/3 Karded peeler, 1/16" cotton	lb.	.46
15/3/3 Karded peeler, 1/16" cotton	lb.	.44
12/4/2 Karded peeler, 1/16" cotton	lb.	.45
23/5/3 Karded peeler, 1¼" cotton	lb.	.46
23/5/3 Combed Egyptian	lb.	.46

Leno Breaker

8¾ ounce and 10¼ ounce 60" Karded peeler	lb.	.46

THE February cotton market reacted with depressed prices to such factors as Japanese advances in the Pacific and the Administration's proposal to hold prices at parity and its disapproval of pending legislation to modify the Commodity Credit Corp.'s power to sell surplus commodities. Although the price fluctuations were irregular, steady gains toward the middle of the month caused recovery of earlier losses. The uncertainties of the trade regarding the pending legislation are reflected in the movement of the ⅞-inch spot middling price which, after closing at 20.10¢ per pound on January 31, dropped to 19.58¢ per pound February 2, rose to 20.70¢ per pound February 6, was quoted at 20.12¢ February 16, and closed at 20.24¢ February 28.

The Bureau of the Census reported a record consumption in January of 945,909 running bales, compared with 887,326 bales in December, 1941, and 844,939 bales in January, 1941. Stocks held by mills reach a new high of 2,494,186 bales on January 31, against the previous peak of 1,878,231 bales in December, 1941. Mills, it is reported, are adding to their stocks to protect themselves against future requirements as consumption increases and certain desirable grades become scarce. Cotton in public storage and at compresses on January 31 was 12,857,221 bales, against 13,713,773 bales on December 31 and 14,672,545 bales January 31, 1941.

Total supply of free American cotton in this country this season, after allowing for cotton going into government loan, but before allowing for release from government stocks, is estimated at 14,261,000 bales by the Cotton Exchange Service. Total distribution of free American cotton in the current season is estimated at 11,350,000 bales. Cotton in the 1941 loan is placed at 2,200,000 bales. The total carry-over on August 1 next is estimated at 2,900,000 bales plus releases from government stocks and repossessions from the 1941 loan. At the beginning of the current season the carry-over was 5,636,000 bales.

In February the WPB froze SXP American Egyptian cotton seed held by all cotton seed mills. It also authorized 11 Texas, Arizona, and Georgia cotton seed mills to sell SXP American Egyptian cotton seed to growers and to the Commodity Credit Corp. Any person purchasing the seed, except the CCC, may use it only for growing such cotton or additional seed. This long staple cotton is needed for balloon cloth and other aviation equipment.

Fabrics

Sales of cotton grey goods in the fabrics market last month were fairly large and close to production. Market conditions were generally spotty. Although business was in fair volume in print cloths, osnaburgs, and ducks, other goods were generally rather quiet. There was heavy demand for sheetings for raincoats but some slackening in demand for other rubberizing fabrics, which is expected to hold until there is a clarification of rubber allotments.

On January 28 the WPB announced plans for creating 200,000,000 yards of osnaburgs as a stockpile against future needs; but as we go to press, it is reported that some clarification is in prospect regarding the manner in which the cloth will be supplied. In some quarters it is felt that the quantity requested will be decreased to an amount which will cover actual needs over a reasonable period of time.

Textile mills in southern states are generally increasing production facilities. Firm price conditions are expected in the fabrics market as long as recent demands for heavy cloths continue. Prices on many grades of drills, ducks, and sheetings are unchanged. Osnaburgs are quoted at established ceilings. Tire fabrics are up 1¢ per pound.

Quebec Group

(*Continued from page* 591)

and Uses of Colloidal Blacks in Rubber and Plastics." J. R. Snyder, of the same company, discussed electrically conductive carbon blacks and their uses. In the discussion period that followed both men answered many questions concerning blacks for reclaim compounding.

Latex Extension Process

A NEW process developed in the laboratories of the Union Bay State Co., 50 Harvard St., Cambridge, Mass., is said to extend the volume of latex from 50 to 300% (depending upon the intended application), while retaining the essential characteristics of the original product as well as a good proportion of its natural strength. After being thus treated, normal (38%) latex is returned to its owner with a concentration of 37%, and concentrated (60%) latex is returned with a 55% total solids content.

The new process makes use of a filler material of such fine size that it reportedly blends extremely well with the rubber particles of the latex. This blending characteristic, together with the filler material's many points of similarity to latex (response to the same reagents, same wetting out properties, etc.) is said to make the extended product adaptable to customary latex cementing, impregnating, and coating operations, without appreciable loss of efficiency.

S.A.E. Meets March 12

AIRCRAFT icing problems will be discussed by Willson H. Hunter, of The B. F. Goodrich Co., on March 13 at the two-day national aeronautic meeting of the Society of Automotive Engineers, Inc., which opens March 12 at the Hotel New Yorker, New York, N. Y. Eight other technical papers will be presented.

FROM BARRACK BAG...TO UNDERWEAR...

Cotton plays a major role in the equipment of each Army Private. Out of approximately 40 items of personal equipment issued to every private in our Army, 18 of them represent uses of cotton fabrics. Duck for tents, leggings and haversacks—denims for fatigue uniforms—terry and huck towels—khaki summer uniforms—light weight field jackets—shirts, ties and handkerchiefs—and so on.

Truly, Cotton is playing an important part in providing protection and comfort to the men in our Army. Because so much of our HOSE and BELTING DUCK is under mandatory priority for Army and Navy use, your normal supplies of these materials will be curtailed during the present emergency.

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Eastern States Representative—
BLACK ROCK MANUFACTURING CO., Bridgeport, Conn.

LETTERS FROM OUR READERS

EDITOR: An item and a photograph on page 501 of your February 1st issue are of particular interest to me. I refer to the few lines under the caption, "General Makes Guayule Tires."

Please note carefully that what follows is not meant to detract in any way from the work that has been turned out by the General Tire & Rubber Co. of Akron. What is about to be said is merely prompted by a twofold purpose.

First, I wish to pay respect to a worthy pioneer in the technology of the Rubber Industry. This more particularly as his work has remained unsung. I refer to Harold T. G. van der Linde.

Second, I want to replace correctly in the chronological development of the rubber industry the manufacture of the first all-guayule tire. I realize fully that the item is of relative importance. Still in time to come, should anyone care to devote sufficient effort to compile a history of the Rubber Industry, it is only proper that the use of guayule should be correctly recorded.

The first all-guayule tires ever made were developed by Mr. van der Linde either in the Fall of 1911 or in the early weeks of 1912, *a mere 30 years ago*. These tires were produced by the Century Rubber Co., Netherwood, N. J.

It is very doubtful that records can be produced to substantiate the statement just made. Mr. van der Linde is not with us, and the winding up of the Century Rubber Co. preceded his demise by many years. It might be added here that the failure of that company was *not* due to their using guayule in their goods.

Mr. van der Linde's aggressiveness, yes, perhaps seeming temerity, in using guayule in such articles as tires was unquestionably the outcome of his association with the Continental Rubber Co. This organization was then engaged in the preparation of the rubber obtained from plants as found in several Mexican districts. Mr. van der Linde had good cause to know guayule and its properties. Effectively, the Continental Rubber Co. had retained his services in conjunction with a lawsuit involving the quality of the rubber delivered by them. Incidently, Mr. van der Linde prepared a report so iron-clad that the suit was settled out of court.

It is possible for me to corroborate the findings obtained by Mr. William O'Neil's staff. The 1911 or '12 casings performed splendidly. Quite true, in those days the tire manufacturers had only a 3,500-mile guarantee.

That the rubber obtained from guayule shrubs was well established already is vouched for by the fact that a very consequential Canadian concern in 1910 had practically stabilized its production of most of its goods, and these commanded very great respect, using only Upper River Fine Para and guayule, needless to say in various proportions.

Another item which perhaps is of value to possible historians is that an inner tube using for crude half Upper River Fine Para and half guayule was shown to no less than Edouard Michelin at the first rubber exhibition in London in 1911. This red inner tube was more than a match for what was turned out at both Clermont-Ferrand and Michelin's factory in New Jersey. M. Michelin's skepticism prompted the actual mixing, calendering, curing, and testing of that very compound by the staff that manned the Continental Rubber Co.'s stand at the first exhibition. All steps were carried out under the supervision of Michelin's chief technician. As luck would have it, the results obtained were actually in excess of the initial data presented.

All that precedes is advanced as the outcome of the writer having been connected: 1. with the Canadian firm to which reference is made; 2. with the staff that conducted the work on the stand of the London exhibition; 3. as an assistant to Mr. van der Linde at the plant of the Century Rubber Co.

I wish again to state that what I deem worthwhile to record for the sake of chronological accuracy is the use of guayule in rubber goods. In no way does this detract from what the General Tire Co. has now performed.

Very truly yours,
M. L. ALLARD

Elma, N. Y.,
February 11, 1942.

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EXACT WEIGHT Scale Model 8006 for rubber goods compounding. Capacity to 22 lbs. Accurate to 1/8 oz.

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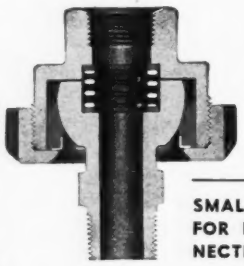

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THE PHILIP CAREY MFG. COMPANY
DEPENDABLE PRODUCTS SINCE 1873
LOCKLAND, CINCINNATI, OHIO

State Quotas for New and Retreaded Tires and Tubes during February, 1942

States	Passenger Cars, Motorcycles, and Light Trucks		Trucks and Buses		
	New Tire Quota	New Tube Quota	New Tire Quota	New Tube Quota	Truck 2/18/28 Retread Quota
Alabama	1,431	1,198	2,856	4,899	1,501
Arizona	583	488	954	1,637	502
Arkansas	912	763	1,821	3,123	1,435
California	7,154	5,988	11,698	20,061	6,147
Colorado	1,111	930	1,816	3,115	954
Connecticut	945	791	1,941	3,326	1,019
Delaware	169	141	332	569	436
Florida	2,003	1,676	4,000	6,859	2,102
Georgia	2,039	1,707	4,071	6,981	2,139
Idaho	442	370	723	1,240	950
Illinois	4,274	3,578	8,387	14,383	4,407
Indiana	2,183	1,827	4,284	7,345	2,251
Iowa	1,753	1,467	3,440	5,898	1,807
Kansas	1,414	1,184	2,775	4,759	1,458
Kentucky	1,084	908	2,127	3,647	1,118
Louisiana	1,395	1,168	2,786	4,776	1,464
Maine	387	324	793	1,360	1,042
Maryland	1,000	837	1,962	3,363	1,030
Massachusetts	1,933	1,618	3,965	6,800	2,084
Michigan	2,871	2,403	5,892	10,102	3,096
Minnesota	1,312	1,098	2,690	4,613	1,414
Mississippi	966	808	1,929	3,307	2,533
Missouri	2,244	1,878	4,400	7,554	2,315
Montana	508	425	831	1,425	437
Nebraska	907	759	1,780	3,053	936
Nevada	207	173	339	581	445
New Hampshire	255	213	524	898	688
New Jersey	2,183	1,827	4,284	7,345	2,251
New Mexico	546	457	893	1,530	1,172
New York	5,364	4,490	11,003	18,870	5,782
North Carolina	2,262	1,893	4,518	7,748	2,374
North Dakota	317	265	652	1,117	342
Ohio	4,059	3,397	7,965	13,658	4,185
Oklahoma	1,949	1,631	3,893	6,676	2,046
Oregon	1,233	1,032	2,016	3,457	1,059
Pennsylvania	4,989	4,176	9,790	16,789	5,144
Rhode Island	359	300	737	1,262	967
South Carolina	1,135	950	2,268	3,889	1,192
South Dakota	352	295	722	1,239	380
Tennessee	1,645	1,377	2,285	5,633	1,726
Texas	6,152	5,149	12,285	21,064	6,454
Utah	528	442	862	1,479	453
Vermont	187	156	382	655	502
Virginia	1,407	1,178	2,760	4,733	1,470
Washington	1,460	1,230	2,402	4,119	1,262
West Virginia	846	708	1,659	2,844	872
Wisconsin	1,277	1,069	2,620	4,492	1,376
Wyoming	245	205	400	687	526
Alaska	26	22	47	81	62
District of Columbia	461	386	905	1,551	455
Hawaii	190	159	346	593	454
Puerto Rico	112	94	204	350	268
Virgin Islands	9	8	15	27	21
Total	80,784	67,616	156,029	268,562	88,505

Dividends Declared

Company	Stock	Date	Payable	Stock of Record
Armstrong Cork Co.	Com.	$0.25 interim	Mar. 3	Feb. 9
Belden Mfg. Co.	Com.	$0.35 irreg.	Mar. 2	Feb. 17
Boston Woven Hose & Rubber Co.	Com.	$0.50	Feb. 25	Feb. 16
Brunswick-Balke-Collender Co.	$5 Pfd.	$1.25 q.	Apr. 1	Mar. 20
Canada Wire & Cable Co., Ltd.	"B"	$0.50	Mar. 15	Feb. 28
Canada Wire & Cable Co., Ltd.	"A"	$1.00 q.	Mar. 15	Feb. 28
Canada Wire & Cable Co., Ltd.	6½% Pfd.	$1.625 q.	Mar. 15	Feb. 28
Collins & Aikman Corp.	Com.	$0.25	Mar. 2	Feb. 17
Collins & Aikman Corp.	Pfd.	$1.25 q.	Mar. 2	Feb. 17
Congoleum-Nairn, Inc.	Com.	$0.25 q.	Mar. 16	Mar. 2
Crown Cork & Seal Co., Inc.	Com.	$0.25 irreg.	Mar. 25	Mar. 9
Crown Cork & Seal Co., Inc.	$2.25 Pfd.	$0.5625 q.	Mar. 16	Feb. 27
Crown Cork & Seal Co., Ltd.	Com.	$0.50 q.	Feb. 16	Feb. 6
E. I. du Pont de Nemours & Co., Inc.	Com.	$1.125 q.	Apr. 25	Apr. 10
E. I. du Pont de Nemours & Co., Inc.	Com.	$1.25 reduced	Mar. 14	Feb. 24
Firestone Tire & Rubber Co.	6% Pfd. "A"	$1.50 q.	Mar. 1	Feb. 15
Flintkote Co.	Com.	$0.25	Mar. 13	Mar. 3
Flintkote Co.	$4.50 Pfd.	$1.125 q.	Mar. 13	Mar. 3
General Motors Corp.	Com.	$0.50 irreg.	Mar. 12	Feb. 13
General Motors Corp.	Pfd.	$1.25 q.	May 1	Apr. 6
General Tire & Rubber Co.	Com.	$0.50 s.	Feb. 27	Feb. 17
General Tire & Rubber Co.	Pfd.	$1.50 q.	Mar. 31	Mar. 21
Goodyear Tire & Rubber Co., Inc.	Com.	$0.375	Mar. 16	Feb. 16
Goodyear Tire & Rubber Co., Inc.	Pfd.	$1.25 q.	Mar. 16	Feb. 16

(*Continued on page 628*)

The term

"COTTON FLOCKS"

does not mean cotton fiber alone

EXPERIENCE

over twenty years catering to rubber manufacturers

CAPACITY

for large production and quick delivery

CONFIDENCE

of the entire rubber industry

KNOWLEDGE

of the industry's needs

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acknowledged superior by all users are important and valuable considerations to the consumer.

Write to the country's leading makers for samples and prices.

CLAREMONT WASTE MFG. CO.

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LONGER LIFE FOR RUBBER GOODS

One of the sure ways to conserve rubber is to make rubber articles last longer. Toward this end the makers of Johnson's Wax have formulated a group of special wax dressings for rubber goods.

These dressings protect rubber articles with a non-porous wax film that retards deterioration by preventing oxidation.

Johnson's Wax Dressings have already been used with great success on auto parts, vacuum cleaner parts, stair treads, rubber-covered wire, toys and many other products. In addition to preventing or retarding oxidation, the dressings also contribute a natural, long-lasting high lustre.

Because of great coverage (approximately 2,000 feet per gallon, or higher), Johnson's Wax Dressings are extremely economical to use. May be applied by dipping, spraying or wiping onto surface. Available in 5 and 55 gallon drums, and in 1 gallon cans.

Samples and further information will be furnished on request.

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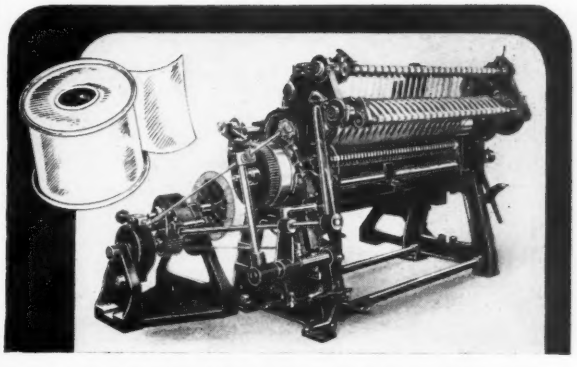

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2453

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	December, 1941		Twelve Months Ending December, 1941	
UNMANUFACTURED	Quantity	Value	Quantity	Value
Crude rubber, etc. ..... lb.	.....	.....	137,930,214	$29,658,703
Latex (dry weight) ..... lb.	.....	.....	4,729,546	1,452,032
Gutta percha ..... lb.	.....	.....	25,895	16,500
Rubber, recovered ..... lb.	1,633,200	$105,784	18,457,000	1,090,405
Rubber, powdered, and gutta percha scrap ..... lb.	577,600	10,096	6,928,200	153,917
Balata ..... lb.	2,172	494	63,699	18,908
Rubber substitute ..... lb.	56,910	19,866	664,900	210,954
Totals	2,269,872	$136,240	168,799,454	$32,601,419
PARTLY MANUFACTURED				
Hard rubber comb blanks	.....	$3,472	.....	$40,314
Hard rubber, n. o. s. ..... lb.	8,445	3,622	59,311	51,734
Rubber thread not covered. lb.	2,737	2,624	46,736	46,939
Totals	11,182	$9,718	106,047	$138,987
MANUFACTURED				
Bathing shoes ..... prs.	.....	.....	35,177	$7,134
Belting	.....	$23,501	.....	205,026
Hose	.....	28,300	.....	341,164
Packing	.....	20,433	.....	131,638
Boots and shoes ..... prs.	804	3,247	10,205	19,784
Canvas shoes with rubber soles ..... prs.	5	12	34,421	13,922
Clothing, including waterproofed	.....	2,896	.....	40,907
Raincoats ..... no.	2,081	10,865	61,159	254,655
Gloves ..... doz. prs.	540	1,464	2,120	7,540
Hot water bottles	.....	1,530	.....	9,452
Liquid sealing compound	.....	5,408	.....	94,229
Tires, bicycle ..... no.	556	393	22,486	16,777
Pneumatic ..... no.	1,139	22,913	26,514	633,505
Solid for automobiles and motor trucks ..... no.	25	825	406	20,130
Other solid tires	.....	1,130	.....	24,363
Inner tubes ..... no.	332	1,178	15,511	53,321
Bicycle ..... no.	334	182	16,027	4,646
Mats and matting	.....	17,296	.....	150,370
Cement	.....	24,500	.....	186,551
Golf balls ..... doz. prs.	1,016	2,346	19,943	38,741
Heels ..... prs.	4,429	405	90,254	9,407
Other rubber manufactures ..	.....	246,789	.....	2,705,232
Totals	.....	$415,613	.....	$4,965,494
Totals, rubber imports ..	.....	$561,571	.....	$37,705,900

Exports of Domestic and Foreign Rubber Goods

UNMANUFACTURED	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
Crude rubber	.....	.....	$73	.....
Waste rubber	$28,856	.....	349,897	.....
MANUFACTURED				
Belting	$49,482	.....	$562,938	.....
Bathing caps	57	.....	4,215	.....
Canvas shoes with rubber soles.	25,642	.....	392,963	.....
Boots and shoes	252,243	.....	2,104,761	.....
Clothing, including waterproofed	33,539	.....	331,412	.....
Heels	5,846	.....	30,025	.....
Hose	44,319	.....	2,101,163	.....
Soles	3,668	.....	19,662	.....
Soling slabs	2,654	.....	11,703	.....
Tires, pneumatic	760,539	.....	6,633,521	.....
Not otherwise provided for ..	23,984	.....	732,621	.....
Inner tubes	62,758	.....	642,120	.....
Other rubber manufactures ..	100,053	.....	663,333	.....
Totals	$1,364,784	.....	$14,230,437	.....
Totals, rubber exports ...	$1,393,640	.....	$14,580,407	.....

Dividends Declared

(Continued from page 626)

COMPANY	STOCK	RATE	PAYABLE	STOCK OF RECORD
Hewitt Rubber Corp.	Com.	$0.25	Mar. 16	Feb. 28
Midwest Rubber Reclaiming Co.	$4 Pfd.	$1.00 q.	Mar. 2	Feb. 20
Okonite Co.	Com.	$0.50 extra	Feb. 2	Jan. 19
Okonite Co.	Com.	$1.50 q.	Feb. 2	Jan. 19
Okonite Co.	Pfd.	$1.50 q.	Mar. 2	Feb. 11
Phelps Dodge Copper Corp...	Com.	$0.40 irreg.	Mar. 10	Feb. 25
Raybestos-Manhattan, Inc. ..	Com.	$0.375	Mar. 16	Feb. 27
Thermoid Co.	Pfd.	$0.75 q.	Mar. 16	Mar. 5
United Elastic Corp.	Com.	$0.30 q.	Mar. 24	Mar. 4
United Elastic Corp.	Com.	$0.30 irreg.	Mar. 24	Mar. 4
Westinghouse Air Brake Co..	Com.	$0.25	Mar. 16	Feb. 14

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★ A SIZE AND TYPE FOR EVERY OPERATION ★

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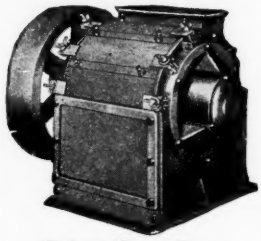

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32″ Diameter, 16″ Stroke, Eight 2″ Openings, 42″ x 54″ Pressing Surface. Working Pressure 2,000 Pounds.

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Hydraulic Press Division
The FRENCH OIL MILL MACHINERY CO.
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The H. O. Canfield Co.

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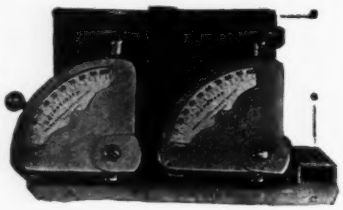

THE SHORE INSTRUMENT & MFG. CO.

Van Wyck Avenue and Carll Street, JAMAICA, NEW YORK

Agents in all foreign countries.

Rubber Questionnaire—3rd Quarter of 1941

Reclaimed Rubber	Inventory at End of Quarter (Long Tons)	Production (Long Tons)	Shipments (Long Tons)	Consumption (Long Tons)
Reclaimers solely (6)	1,957	28,957	29,650	.....
Manufacturers who also reclaim (18)	8,085	21,360	3,318	20,272
Other manufacturers (167)	15,882	.....	.....	23,999
Totals	25,924	50,317	32,968	44,271

Scrap Rubber	Inventory (Long Tons)	Consumption (Long Tons)	Due on Contracts
Reclaimers solely (6)	43,510	30,866	28,091
Manufacturers who also reclaim (16)	56,618	25,272	11,637
Other manufacturers (37)	638	.....	171
Totals	100,766	56,138	39,899

Tons of Rubber Consumed in Rubber Products and Total Sales Value of Shipments

Products	Rubber Consumed Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Accessories		
Passenger car, truck, and bus casings	77,286	$119,418,000
Inner tubes for passenger cars, trucks, and buses	11,173	14,493,000
Farm tractors and implement casings and tubes	2,642	5,480,000
Airplane tires and tubes	472	1,717,000
Motorcycle casings and tubes	112	156,000
Bicycle tires, including juvenile pneumatics (single tubes, casings and tubes)	839	2,568,000
Solid and cushion tires for highway transportation	50	162,000
All other solid and cushion tires	401	1,087,000
Tire sundries and repair materials	3,857	6,102,000
Totals	96,832	$151,183,000
Other Rubber Products		
Mechanical rubber goods	17,156	$59,501,000
Boots and shoes	5,144	23,047,000
Insulated wire and cable compounds	4,328	†
Druggists' sundries, medical and surgical rubber goods	1,112	5,432,000
Stationers' rubber goods	656	1,181,000
Bathing apparel	70	344,000
Miscellaneous rubber sundries	1,599	6,043,000
Rubber clothing	423	3,178,000
Automobile fabrics	102	742,000
Other rubberized fabrics	1,663	8,423,000
Hard rubber goods	1,228	5,597,000
Heels and soles	3,474	7,418,000
Rubber flooring	320	871,000
Industrial sponge rubber; chemically blown	1,615	2,260,000
Foamed latex	1,196	2,075,000
Sporting goods, toys, and novelties	667	2,825,000
Totals	40,753	$129,027,000
Grand totals—all products	137,585	$280,210,000

Inventory of Rubber in the United States and Afloat

	Crude Rubber on Hand (Long Tons)	Crude Rubber Afloat (Long Tons)
Manufacturers	110,886	125,336
Importers and dealers	20,142	20,185
U. S. Government	243,251	.....
Totals	374,279	145,521‡

*Number of rubber manufacturers that reported data was 279; crude rubber importers and dealers, 50; reclaimers (solely), 6; total daily average number of employes (reporting manufacturers and reclaimers), 185,767.

It is estimated that the reported grand total crude rubber consumption is 77.4%; grand total sales value, 76%; the grand total crude rubber inventory, 81.1%; afloat figures, unavailable; the reclaimed rubber production, 70.0%; reclaimed consumption, 66.5%; and reclaimed inventory, 68.1% of the total of the entire industry.

†Owing to the difficulty of securing representative sales figures this item has been discontinued. ‡Including U. S. Government rubber.

Compiled from R.M.A. statistics.

Corrections for First[1] and Second[2] Quarters

	Total Sales Value 1st Q.	2nd Q.
Mechanical rubber goods	....	$61,552
Druggists' sundries, medical and surgical goods	....	3,530
Automobile fabrics	$377	.....
Other rubberized fabrics	4,561	.....
Heels and soles	5,933	6,691
Industrial sponge rubber; chemically blown	2,775	.....
Totals	$97,374	$114,379
Grand total all products	$210,660	$274,381

[1] India Rubber World, Sept. 1, 1941, p. 88.

[2] *Ibid.*, Dec. 1, 1941, p. 324.

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FOR RED RUBBER

. . . . The utmost in pleasing appearance with no deteriorating effect whatever.

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RARE METAL PRODUCTS CO.
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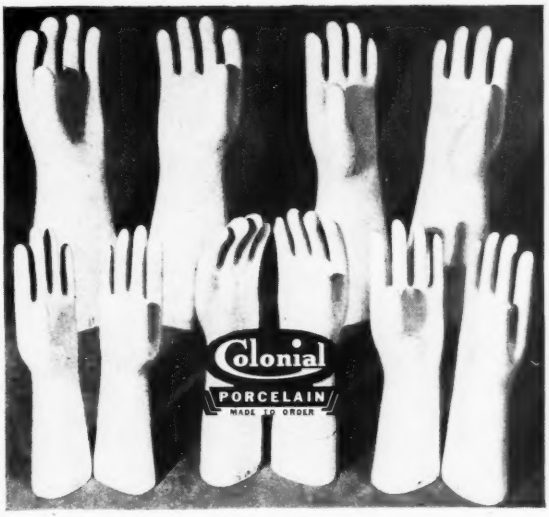

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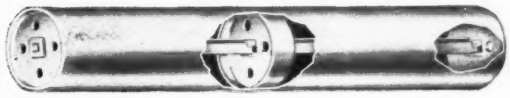

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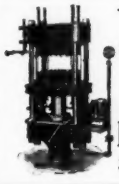

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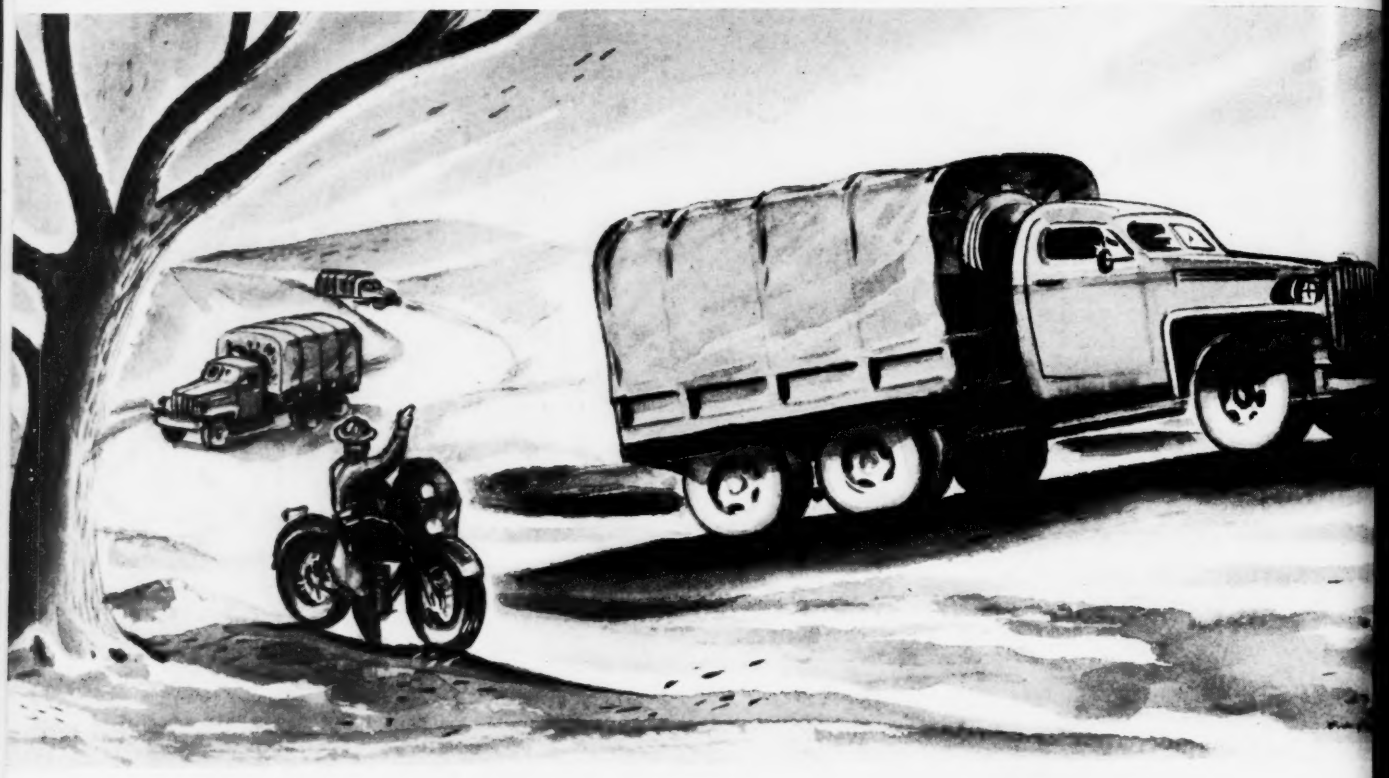

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